

December, 1960

ROADS ^{AND} STREETS

A GILLETTE PUBLICATION

Inside: 10 feature reports, industry news

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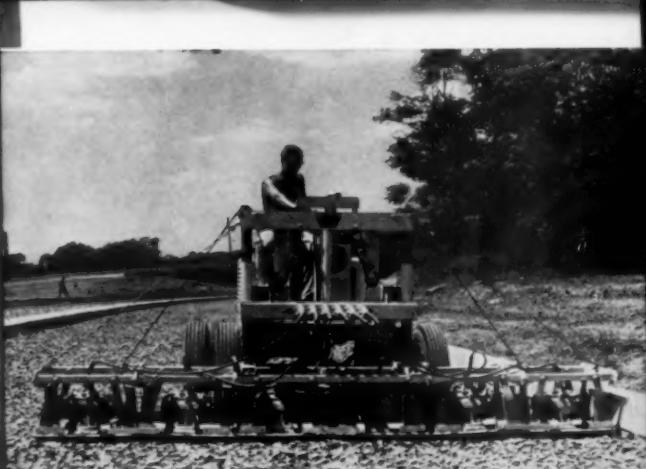
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AMERICA'S MOST POPULAR
MULTIPLE-SHOE
VIBRATORY COMPACTOR



Changing from the 13 ft., 3 inch working width to 88 inches overall for road travel or maneuverability on the job is accomplished hydraulically in just 30 SECONDS.



1. The 2 outer compactor units at each side of the workhead can be hydraulically raised to a vertical position for road travel or maneuverability around other equipment in just 30 SECONDS. Compare this with the time consuming job required on other equipment.

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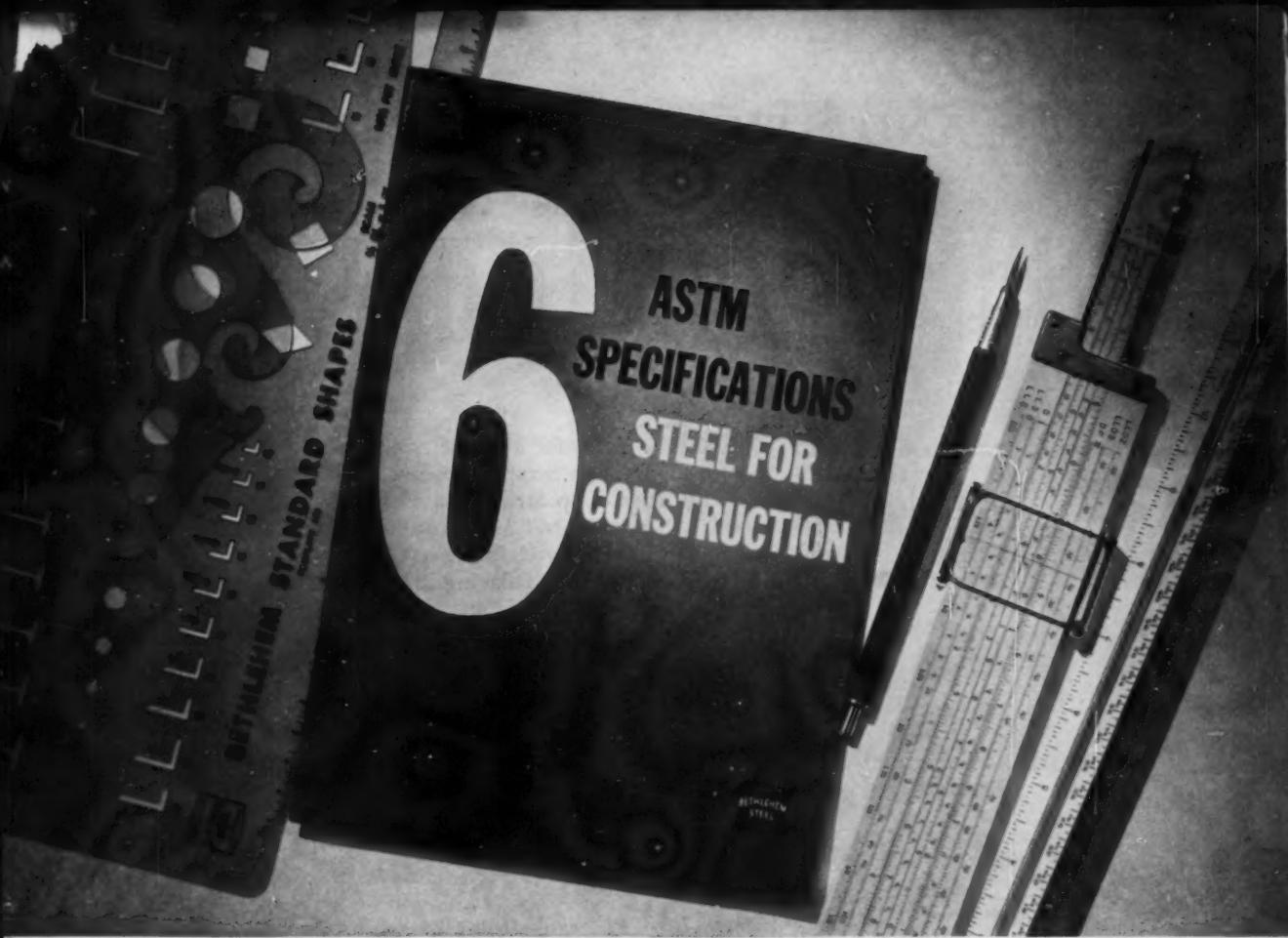


The new widening attachment (optional at added cost) is raised or lowered instantly. Makes the JACKSON by far the most efficient compactor for widening projects.

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the latest ASTM Specifications for the six grades
of structural steel that meet 98%
of all usual construction requirements



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Whether you design or build bridges or buildings, you're sure to find this new booklet of real value.

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STEEL**

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FRONT COVER SCENE

Loading rock from twin tunnels completed during the 1960 season on I-70 near Idaho Springs, Colorado. Eimco 105 Excavator and Koehring Dumper, shown, are part of the equipment used by Colorado Constructors, the contractor.





BEST BET FOR BIG BIDS

Let Goodyear show you ways
to cut your tire costs

Competition for big jobs keeps you on your toes. That's why it pays to do everything possible to protect your profit margin. And much of your success on the big jobs rides on the tires you use.

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He's ready with On-The-Job Service whenever you need it. Goodyear Contractor Service means that you can have a tire-maintenance program on-the-job. This service is geared to save man-hours, machine-hours and tire life.

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Jounce it over the roughest terrain and the Goodyear Super Road Lug shrugs off flexing, cuts and piercing blows. Reason? This tire embodies new and advanced super-toughening agents that make it super-tough on wear. What's more, rugged 3-T Processed Cord (nylon or rayon) — triple-tempered by Tension, Temperature and Time — give you unequalled tire strength and stamina.

Why not get the full story on the performance and savings that make the Super Road Lug your best bet for big jobs — and details on Goodyear Contractor Service — before your next bid. Just call your Goodyear dealer — or write Goodyear, Truck Tire Department, Akron 16, Ohio. Remember, lots of good things come from Goodyear.

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GOOD^YEAR

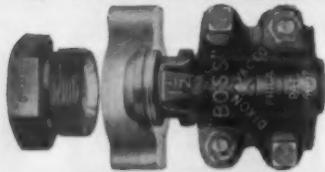
MORE TONS ARE HAULED ON GOODYEAR TRUCK TIRES THAN ON ANY OTHER KIND

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Road Lug — T. M. The Goodyear Tire & Rubber Company, Akron, Ohio

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GROUND-JOINT FEMALE COUPLING, STYLE X-34

SO Reliable FOR PILE DRIVING

...AND ANY
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Unequalled for safety, efficiency and long service life. Ground-joint union between stem and spud provides leak-proof, trouble-free seal... no lost or worn-out washers to replace. All parts malleable iron or steel, rustproofed. Furnished with superstrong "Boss" Offset and Interlocking Clamps. Sizes $\frac{1}{4}$ " to 6", inclusive.

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STYLE MX-16



Companion coupling for "GJ-Boss", described above, and "Boss" Washer Type Couplings Style W-16. Each size fits same size hose... oversize hose not required. Furnished with "Boss" Offset and Interlocking Clamp. Sizes $\frac{1}{4}$ " to 6", inclusive.

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ROADS AND STREETS

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Miro-Flex will meet state and
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ROADS AND STREETS, December, 1960

9 Euclid Scraper Models . . .



one is just right for your job!

Whatever your work may be — from small grading jobs such as land improvement, secondary road building or plant site preparation to the million yard-and-over contracts — there's a "Euc" that matches the job. With three types and nine models, Euclid offers the most modern and complete line of scrapers in the industry.

There are six-wheelers with struck capacities of 12, 18, 24 and 33 yds. . . . all-wheel drive "Twins" of 14 and 24 yds. . . . and three overhung engine models of 7, 12, and 21 yds. For facts and figures proof that Euclid Scrapers are your best investment, call the Euclid dealer in your area.

EUCLID DIVISION OF GENERAL MOTORS, CORP., CLEVELAND 17, OHIO



EUCLID

FOR MOVING EARTH, ROCK, COAL AND ORE

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Despite acid fumes and Ohio winter...

M50® paint applied in Spring matches color of M50 paint applied previous Fall

One of the many outstanding properties observed during National Lead exposure tests of M50® basic lead silico chromate pigment paints was a remarkable resistance to fading. The practical value of this property is brought out by an event in the repainting of The Harvard-Dennison Bridge in Cleveland, Ohio.

At the close of the 1958 painting season, this repainting had been only partly completed. In Cleveland, that winter was particularly hard on paint... periods of heavy precipitation and cold alternating with warm, sunny days. And... notice the smoke in the picture above... this particular bridge lies in the direct path of acid fumes from the stacks of a nearby chemical plant.

Despite all this, when the contractor began to paint again in the Spring, no color difference could be detected at the boundary between the previously applied M50 paint film and the new.

What makes this color retention so remarkable is that it is obtained in

... for more details circle 306 on enclosed return postal card

a finish paint that also provides the rust inhibition of a standard primer. Only paints made with basic lead silico chromate pigment combine the anti-corrosion action of a primer with the weather resistance, durability and tintability of a finish paint.

Now, for the first time...

Paint suppliers are providing states, counties and municipalities with true "Defense-in-Depth" against corrosion... paint systems with an active rust inhibitor, basic lead silico chromate, in all coats, primer, intermediate and finish. If you are not yet acquainted with these modern paints, ask your regular suppliers about them. They're setting new standards for durable metal protection.



Applying M50 alkyd primer coat over commercially sand-blasted surface.



Grey M50 alkyd finish coat goes on with complete color uniformity.

M50 an oncor®

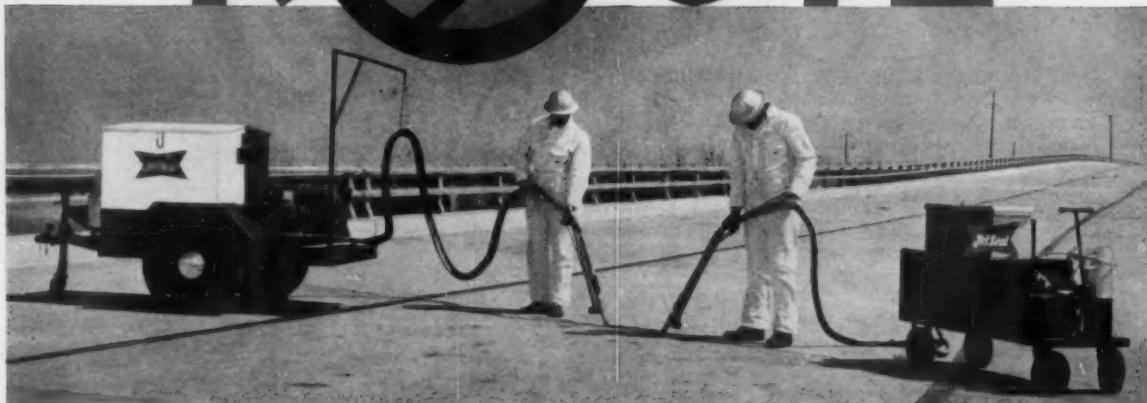
Pigment... A Development of

National Lead Company
General Offices: 111 Broadway, New York 6, N.Y.

ROADS AND STREETS, December, 1960

best ROUTE

ALLIED JetSeal

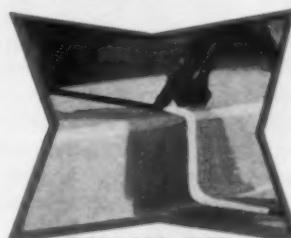


to better sealing

THE REASONS WHY ...

- JET SEAL (9015H) has no flow, even at elevated temperatures (200°F).
- Vertical and overhead joints can be sealed without any special preparation.
- JET SEAL will prevent penetration of water into joints.
- JET SEAL is highly resistant to highway salts.
- JET SEAL will prevent incorporation of incompressible materials.
- JET SEAL has positive adhesion, cohesion, resilience, and ductility at low temperatures (-20°F).
- JET SEAL is quick curing. Construction can be open to all traffic within one hour.

For further information, write to:



**IDEAL FOR CURB
JOINTS—TIGHT SPOTS**

With the new COMPACT Applicator (Model X-691-E above), curb joints, wing walls—any tedious sealing problem is solved. Both JET SEAL Applicators offer the highest sealing efficiency, and are the only equipment authorized for placement of Allied JET SEAL.

HIGHWAY ENGINEERS SPECIFY ALLIED JET SEAL

Highway construction engineers the nation over are specifying Allied JET SEAL as the preferred concrete joint sealant. JET SEAL's superior sealing qualities mean time, labor, and money saved during application and through JET SEAL's exceptionally long life.

Listed on the left are some of the reasons why Allied JET SEAL joint sealant specifications have been adopted by these states:

California, New York, Texas, Tennessee, Connecticut, Minnesota.

Allied JET SEAL can solve your concrete joint sealing problems on highways and bridges (including vertical joints). JET SEAL (9015H) is the most efficient concrete joint sealant ever devised.

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MATERIALS CORP.**

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Bridge widened quickly, inexpensively,

On North Avenue in the city of Brookfield, Wisconsin, a narrow bridge was hampering traffic in and out of the city. A new residential development was slated to be built nearby, which would mean still more traffic. The bridge had to be widened. It was done quickly and inexpensively, thanks to Corrugated Galvanized Steel Culverts.



Here's how they did it: two 15-foot lengths of 84-inch diameter beveled end Corrugated Steel Pipe were laid side by side on each side of the existing bridge. The round ends were mortared inside the bridge opening, the beveled ends facing out. Fill was loaded and graded to conform with the angle of the beveled end of the pipes. Gravel and crushed rock were placed, the roadway itself was then resurfaced and widened, and the job was complete. Pipe installation took less than a week, and now Brookfield's bridge is six feet wider.

According to information received from the City Engineer's Office, the installation of a Corrugated Galvanized Steel Culvert drastically cut both construction time and construction costs. Other methods would have required additional supporting members, which alone would have cost as much as the pipe. A corrugated culvert was the least expensive, and it was felt that it was as sound a construction method as could be used.

Quick, economical installation is just one advantage of Corrugated Galvanized Steel Drainage Structures. They cost less, are free from upkeep and repair, and they're built to last. For more information on Corrugated Galvanized Culverts, send for U. S. Steel's free booklet, "USS Culvert Sheets for Corrugated Metal Drainage Products."

Write today, to United States Steel, 525 William Penn Place, Pittsburgh 30, Pennsylvania.

USS is a registered trademark

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Tennessee Coal & Iron—Fairfield, Alabama
United States Steel Supply—Steel Service Centers
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United States Steel

Watch United States Steel's special Christmas show, *The Coming of Christ*, in Color on NBC-TV, Wednesday, December 21, 8:30 P.M., E.S.T.



This mark tells you a product is made of modern, dependable Steel.

with Corrugated Galvanized Steel Culverts



LUBE LOGIC

Five tips to

Texaco "lay-away plan" protects exterior of idle equipment

Equipment that won't be needed for a while is sometimes simply parked somewhere so nobody will fall over it. Well and good, but not enough—because rust and corrosion account for almost half of what you spend on equipment maintenance. Here's a 6-step program that

will keep idle equipment in cracker jack shape no matter how long it's out of use, or where it's stored. The basic ingredient is Texaco Rustproof Compound L—a remarkable product that keeps rust from starting, and acts to loosen rust that's already on the equipment.



Before applying Texaco Rustproof Compound L, make sure all exterior surfaces are clean and fairly dry.



Coat all adjustment bolts and other exposed threads with Rustproof Compound to facilitate removal or adjustment.



At temperatures of 65° or more, Texaco Rustproof Compound L can be applied to smooth accessible surfaces by brushing.



At temperatures below 65°F, or for inaccessible and complicated areas, spraying is the best way. You can thin the Rustproof Compound to a sprayable consistency by adding naphtha to form a 10 to 50% solution. Add the naphtha slowly to the compound and stir vigorously so the whole batch is the same consistency.



Apply tags at conspicuous points on the equipment describing the rustproofing measures that have been taken.



Thoroughly lubricate all equipment before storage.

Starting up equipment after storage



In most cases it's not necessary to remove Texaco Rustproof Compound L. You should, however, remove it from surfaces that will come into contact with personnel (such as ladders, seats and handles) and from surfaces that are heated to high temperatures when the equipment is operated.



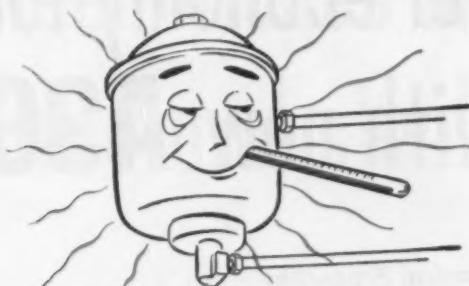
Since Texaco Rustproof Compound L is not a lubricant, all working surfaces and lubrication fittings should be wiped clean before use, and the correct lubricant should be applied before starting up.

Thicker oil won't stop gear-case drooling

You can't fix leaking seals on a gear-case simply by switching to a heavier-grade gear lubricant, because in gear cases carrying heavy loads, the thicker oil simply increases gear-case temperature, which thins out the oil and it starts leaking again. Sometimes,

however, foaming and leaking of gear-case lubricant indicates that the oil level is too high. By keeping vents open and keeping the oil at the recommended level, you prevent build-up of pressure which would cause leakage.

trim maintenance costs



A filter that's working runs a temperature

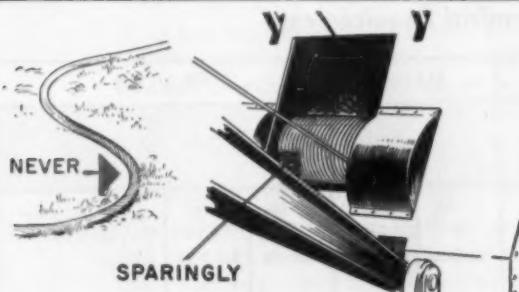
Oil filters last so long these days it's sometimes hard to say when they were last changed. But they're so important to engine performance that it's essential that you know whether they're too full to filter right. Here's a simple way to find out.

A filter that's working will be as warm as the engine oil. If the filter on a fully warmed-up engine remains cool to the touch, it's a safe bet that it's too clogged up to let any oil through. Just to double-check, tap the filter case sharply. A metallic ringing sound means the cartridge is still in good shape. A soggy thud often means that the filter is loaded. Top mileage for even the best filter is 6,000 miles, never more.



Crawler treads are happier dry

There are few places where good lubrication is more important than in track-roll bearings, but make sure you don't lubricate the crawler treads themselves in a burst of enthusiasm. The pins that connect the links of crawler treads are designed to operate without lubrication, because dirt or other abrasives would act as a lapping compound in service. Result: much shorter service life for the track. Moral: if you don't want to lap your crawler link pins, don't oil them.



How often should you lubricate wire rope?

How much lubrication is good for wire rope and cable depends mainly on how it's used. Cables that are dragged in dirt shouldn't be lubricated at all. Oil simply holds the dirt where it can work into the strands and cause rapid wear. Cables that are wound on drums equipped with clutches should be lubricated sparingly to prevent fouling the clutch faces with lubricant. With other wire ropes, apply Texaco Crater A every 10 to 100 hours as necessary to avoid dryness. Be sure to clean the rope before adding new lubricant.



TEXACO LUBRICATION ENGINEERS

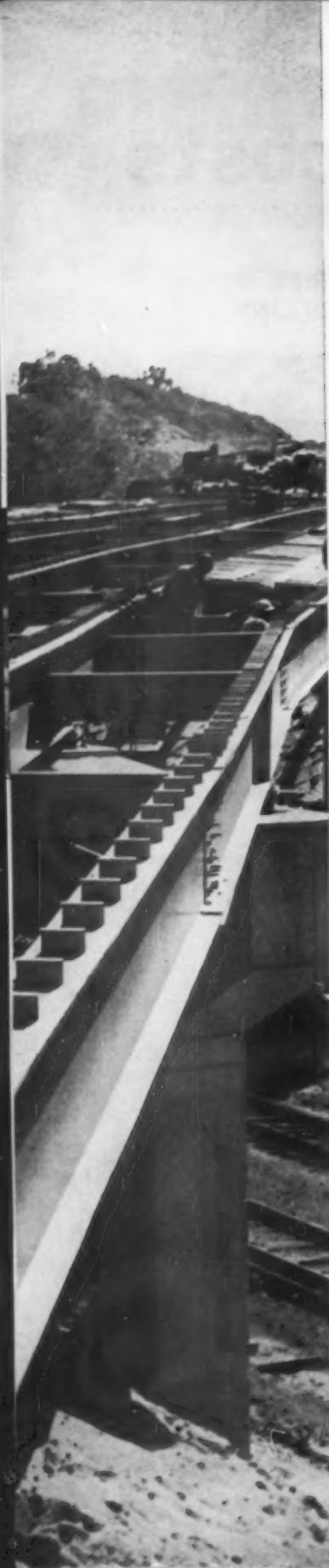
Every month or so we'll bring you a batch of "sleepers," little angles, so easy to overlook, where big savings in money and time can be made. But month in, month out, your local Texaco Lubrication Engineer is the best source of money-saving lubrication ideas. Don't forget that "Lubrication is a major factor in cost control."

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Throughout the United States
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Now! Greater economy for with new A36

Mechanical Properties

	A7	A373	A36
Yield Point, min. psi . . .	33,000	32,000	36,000
Tensile Strength, psi: For shapes of all thicknesses	60,000 to 75,000		
For plates and bars. Up to 1½ in., incl., in thickness	60,000 to 72,000	58,000 to 75,000	60,000 to 80,000
For plates and bars over 1½ in., in thickness	60,000 to 75,000		
Elongation in 8 in., min., per cent	21	21	20
Elongation in 2 in., min., per cent	24	24	23

Chemical Requirements

	SHAPES		BARS		PLATES		
	C max.						
A7	...	...	...	...	...	...	...
Mn . . . . .	...	...	...	...	...	...	...
Si . . . . .	...	...	...	...	...	...	...
			¾ in. & under	Over ¾ in. to 4 in.	¾ in. & under	Over ¾ in. to 1½ in.	Over 1½ in. to 4 in.
C max.	.28	.28	.28	.28	.28	.28	.28
A36	Mn . . . . .	...	...	.60/.90	...	.80/1.10	.85/1.20
Si . . . . .	...	...	...	...	...	...	.15/.30
	Other than Group A	Group A heavy W.F.	1 in. & under	Over 1 in. to 4 in.	½ in. & under	Over ½ in. to 1 in.	Over 1 in. to 2 in. to 4 in.
A373	C max. .28......	.28 .50/.90...	.28......	.28 .50/.90...	.26......	.25 .50/.90...	.26 .50/.90 .15/.30 .27 .50/.90 .15/.30

BETHLEHEM STEEL

steel bridges and buildings structural steel!



for strength
... economy
... versatility

- Adopted by the ASTM on June 16, 1960
- Approved by the Bureau of Public Roads
- Recognized by the A.I.S.C.

ASTM Specification A36 covers carbon steel shapes, plates, and bars of structural quality not over 4 in. in thickness for use in the construction of bridges and buildings, and for general structural purposes.

10 PER CENT STRONGER THAN A7 AND A373

A36 has an increased yield point of 36,000 psi, and is approximately 10 per cent stronger than A7 and A373. The higher yield point of A36 allows increased design stresses using the same factors of safety.

WELDABILITY IS NO PROBLEM

A373 has been generally specified for welded construction of bridges and buildings. The chemical requirements at left indicate how closely A36 agrees with A373 in chemistry and, therefore, in weldability. Where weldability is required, the controlled chemistry will permit the use of A36.

INCREASE IN YIELD POINT SAVES WEIGHT

The substantial increase in yield point for A36 makes it a real bargain in strength-to-weight ratio at a very nominal cost. The weight saved by designing with A36 steel will result in even greater economy for steel construction.

A36 IS AVAILABLE IN ALL SIZES AND SHAPES

A36 can be furnished from the same schedules and in all sizes and shapes in which A7 and A373 are rolled.

FOR MORE INFORMATION on new A36 steel, write for Folder 773, and Booklet 569. Or get in touch with the Bethlehem sales office nearest you.



BETHLEHEM STEEL COMPANY
BETHLEHEM, PA.

Export Sales: Bethlehem Steel Export Corporation

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Steel wheels specified. Dual pneumatic tires standard.

LIMA AUSTIN-WESTERN

Crushes old concrete to aggregate subbase

"We crush old concrete into 2½-in. aggregate for a subbase on asphalt and stone parking areas. Our portable Lima Austin-Western 2036 primary jaw crusher turns out a high daily tonnage with an absolute minimum of maintenance. We also have a Lima A-W apron feeder on another plant. The feeder has doubled production.

"Based on our experience with the crusher, feeder, and an Austin-Western grader, I'd say that the

Baldwin-Lima-Hamilton Corporation turns out quality products which hold up longer and do better jobs than most competitive equipment."—*George H. Souter, Gargaro & Souter, Inc., Detroit.*

Lima Austin-Western offers a complete line of top quality crushing, screening and washing equipment. The finest materials, skilled workmanship, simplicity of design, and engineering experience are reflected in performance records. Depend on Lima Austin-

Westerns for accurately sized gravel in quantity and years of trouble-free service. Choice of compact, self-contained portable units or custom-engineered stationary installations. Both types assure you high-speed operation and lower tonnage costs. Ask a Lima A-W owner. See your nearest Lima Austin-Western distributor for facts and figures. Or write to Construction Equipment Division, Baldwin-Lima-Hamilton Corporation, Lima, Ohio.

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NEW

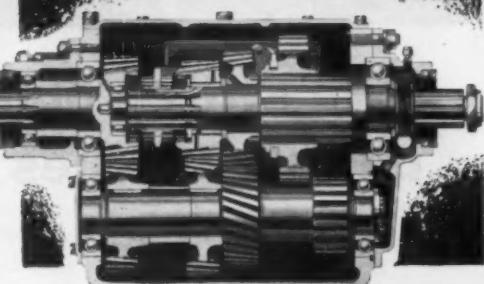
for Medium-Heavy Duty Trucks and Tractors

4-SPEED AUXILIARY TRANSMISSIONS

MODELS 4-B-73

AND

4-B-75



SPLIT GEARS AND GO...SHIFT INTO DEEP REDUCTIONS AND PULL

You no longer have to pay a premium price for a 4-speed auxiliary which is heavier than your operation demands. Save weight and money with one of the new Fuller 4-speed Auxiliaries equipped with overdrive, direct, low and low-low gear ratios in one compact, 375-pound unit. Get gear-splitting ratios plus deep reduction.

The Fuller 4-B-73 is designed for use with engines producing approximately 500-600 lb./ft. of torque. Use of special high-capacity bearings permits the 4-B-75 to be used with engines in the 600-700 lb./ft. torque class.

Get all the extras of price, performance and payload. Specify the new Fuller 4-B-73 or 4-B-75 4-speed Auxiliary Transmissions. For full details, see your truck dealer or write Fuller Manufacturing Company.

GEAR RATIOS
Models 4-B-73 and 4-B-75

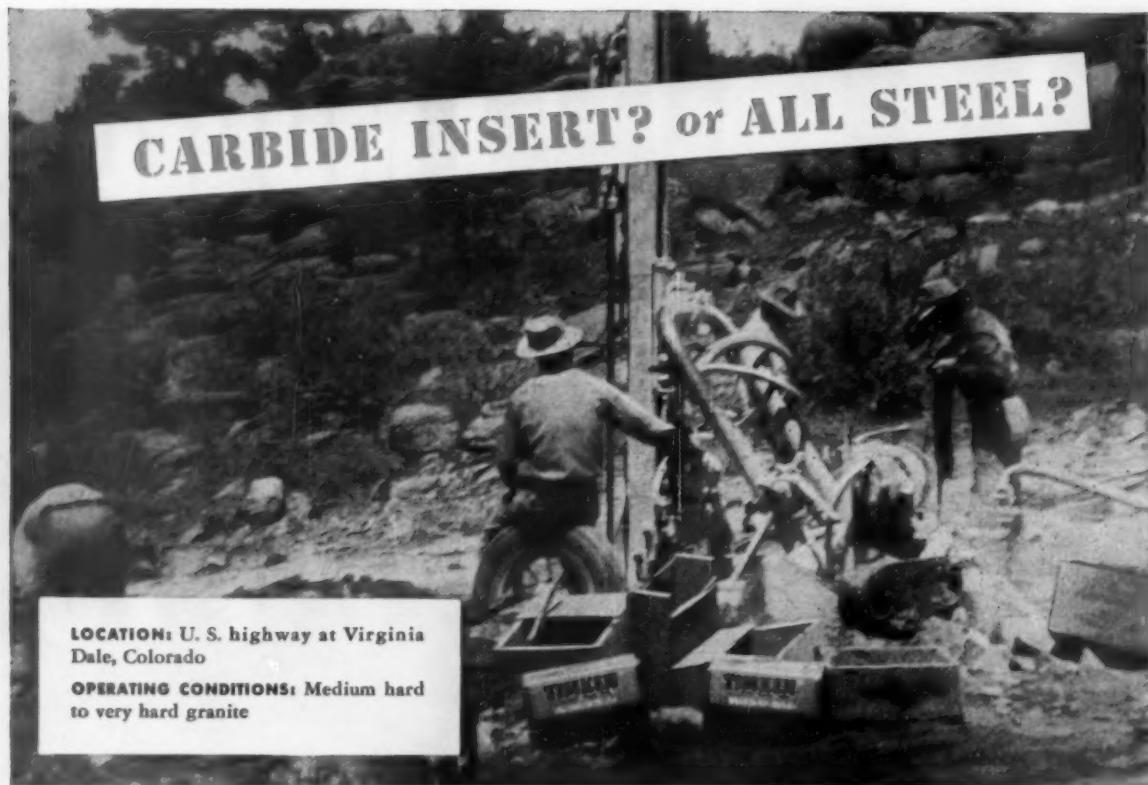
Overdrive	.85
Direct	1.00
Low	1.24
Low-Low	2.22

FULLER

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"We switch our TIMKEN® bits and drill up to 10 inches per minute in granite"

. . . Reports Northwestern Engineering Co.

GRANITE in varying hardness—that was the problem facing Northwestern Engineering Co., of Denver, in drilling the blast holes for relocation of the U.S. highway at Virginia Dale, Colorado. They solved the problem by using Timken® all steel multi-use bits in the *medium-hard* granite—then switching to Timken carbide insert bits for the *very hard* granite. And they averaged 6 to 10 inches per minute!

Switching your Timken bits like this can prove economical for you, too. Timken carbide insert bits are your best bit for drilling in hard,

abrasive ground. But in softer ground use Timken all steel multi-use bits. Both bits are interchangeable in the same thread series. Without changing drill steels, you can change bits quickly and easily as the ground changes.

All Timken rock bits are made from world-famous Timken fine alloy steel. And for even longer life, Timken bits have a specially developed shoulder union that protects threads against drilling impacts.

Get all these advantages by using bits made by the world's largest manufacturer of removable rock

bits. Timken bits! For help in selecting just the right bit, call or write: Timken Rock Bit Engineering Service, The Timken Roller Bearing Company, Canton 6, Ohio. Cable: "TIMROSCO". Makers of tapered roller bearings, fine alloy steel and removable rock bits.



Timken threaded all steel multi-use rock bit



Timken threaded carbide insert rock bit

TIMKEN®

your best bet for the best bit for every job

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ROADS AND STREETS

Sixty-Eight years of Editorial Leadership

Washington News Letter

By Duane L. Cronk, Director, Highway Information Services

December 10, 1960

The U.S. Controller General upset the apple cart last month when it announced that the Davis-Bacon provisions of the Federal-Aid Highway Act can not be enforced. The Labor Department is upset, to say the least, and emissaries are frantically attempting to obtain a reconsideration.

The Controller General's decision was provoked by presentation of a case against the John B. Dover Construction Co., of Clinton, Tenn. Dover reportedly violated the minimum wage requirement of the federal law and the Labor Department has recommended that he be black-listed. To the Department's chagrin, the Controller decided that statutory debatement could not be imposed in such cases.

The federal government may require that prevailing wages be paid on Interstate jobs, but there is nothing in the legislative proceedings or the Act which indicates that this requirement may be enforced, the Controller declared.

* * *

The Davis-Bacon thing has been a bone of jurisdictional contention ever since it was applied to highway work. For awhile, the Department of Labor and the Department of Commerce argued over responsibility for enforcement. The Controller General's decision throws the whole issue into uncertainty again. Observers here feel a compromise will be worked out to permit enforcement very soon, but in the meantime, highway industry men are alternately amused and irritated.

The U.S. Chamber of Commerce asserts that the whole procedure supports their contention that the law ought to be repealed outright. Eugene A. Keeney, secretary of the Chamber's Walsh-Healey and Davis-Bacon Committee, maintains:

"Davis-Bacon may serve a purpose in some low-paid industries, but it certainly has no place in the highway program. Its use should be restricted to construction of buildings intended for occupancy by federal government bodies. It has been nothing but a source of inconsistency and confusion to the highway program."

"When four federal agencies can't agree on its implementation or its jurisdiction, how can highway contractors know whether to follow it or forget it?"

* * *

Speculation is rife over what the attitude of the new Administration will be toward the highway construction program and who will be the new Federal Highway Administrator and Commissioner. Naturally, the industry is hopeful that both jobs will be filled with men of the calibre of Bertram Tallamy and Ellis Armstrong, both

(continued on next page)

of whom have "worn well" through difficult times and under the burden of organizing and administering the National Highway Program.

Last month, Mr. Armstrong announced his acceptance of the post of president of the Better Highways Information Foundation, a move that has been universally acclaimed here.

Most of the Washington highway fraternity were in Detroit last month where news was being made at the AASHO convention. The subject of major interest was how to prevent scandals resulting from poor construction.

AASHO President David H. Stevens of Maine told the state highway officials that the old days of complete federal acceptance of state inspection are long gone. The state highway departments are losing their independence for two reasons, he said:

First, because of the size of the program itself and the heavy federal responsibility in it.

Second, due to the evidence of improper practices on the part of some states.

On both counts, Stevens said, the states can stem the tide to a great extent by demonstrating their ability to administer large programs and to keep their skirts clean.

* * *

As a concerted attempt to upgrade inspection procedures, AASHO approved at the meeting an informational guidebook for member departments. A top-notch committee of the organization took a fresh look at every stage of construction where discrepancies and sloppy workmanship might occur and attempted to write preventive recommendations. The guidebook advised state engineering departments to tighten up their inspection procedures, to institute spot checks, to re-establish lines of authority in the field, and to demand stricter adherence to specifications.

Because of the public skepticism of right-of-way operations, the new guidebook also laboriously spells out safeguard and double checks. And because of the controversy which attends the choice of a pavement type, the departments were urged to document such decisions thoroughly.

In all the concern over such procedures, BPR Commissioner Armstrong said, it is important that highway departments do not lose confidence in their own people or the desire of the contracting industry to build high-quality roads. "Experience has demonstrated and proven that we can rely upon the basic honesty, skill, and pride of workmanship of the contractors' workmen to do a sound job, both quality-wise and economy-wise."

And, Administrator Tallamy concluded, after a comprehensive review of all that highway officials can be proud of during the last four years, "Looking to the future, I know the Interstate System will be completed quickly and when it is, everyone will be justly proud of it. Keep going strong!"

Also at AASHO . . . The chief administrators approved a scheme to establish a revolving fund for highway research. Each state would kick in a small percentage of its 1½% funds but the total of \$2½ million annually could sponsor a number of badly needed research projects.

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**keeps concrete-hungry
pavers on the go . . .**

Working high-production pavers? Keep 'em in mix with a Johnson Automaster-C. This highly portable cement batch plant moves in and sets up fast. And you can relocate it in short order to keep ahead of paving work. All parts of the plant package are pre-assembled into compact, easy traveling packages. Simple plug-in connections eliminate complex field wiring hookups.

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Automaster-C has 1560 cu. ft. of overhead cement storage. Auxiliary ground silos are available in a wide range of capacities. Take your choice of one or two 14 cu. ft. cement batchers. Single batcher weighs out up to 180 batches per hour . . . dual batchers up to 360. Batch size: 1½ cu. yds. for each batcher.

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To meet U.S. Engineer specifications, batching equipment can be furnished with dial scales, 12-mix selector system, graphic pen recording, time and date stamp, interlocks, and aggregate moisture compensating beams. Ask your Johnson distributor for details.

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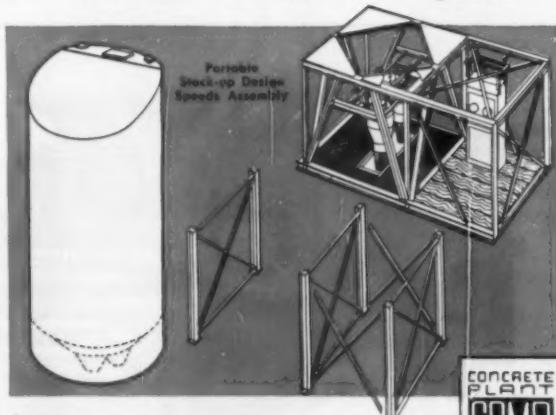


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21

*Economy never came
in such a choice!*

NEW FORD TRUCKS FOR 1961

619 new models! All engineered with one idea in mind . . . economy! New "Big Six" engine for 2-tonners plus five Cummins diesels for the new H-Series tractors expand the proven line of Ford engines to 18—with one just right for your job. A wider-than-ever choice of transmissions and axles! And . . . on all 1961 Ford Trucks, each part, except tires and tubes, is now warranted by your dealer against defects in material and workmanship for 12 months or 12,000 miles, whichever occurs first. The warranty does not apply, of course, to normal maintenance service or to the replacement in normal maintenance of parts such as filters, spark plugs and ignition points.



New! "Big Six" Engine

More power for America's savingest 2-tonners . . . a big 262-cu. in. Six with the performance of big displacement, the durability of heavy-duty construction, plus the gas economy of 6-cylinder design! Available early 1961. You also get improved riding comfort with new smoother-acting springs and a sturdy front suspension that can give up to twice the tire life of other makes.

Now! 100,000-Mile or 24-Month Warranty on Ford Truck Super Duty Gas Engines

New 100,000-mile warranty on Super Duty V-8 gas engines is most liberal in the industry. On 401-, 477- and 534-cubic-inch V-8's, Ford Dealers will replace any major engine part (including block, heads, crankshaft, bearings, valves, pistons, rings) found to be defective in materials and workmanship in normal on-highway use. Warranty covers full cost of replacement parts for 100,000 miles or 24 months, whichever occurs first . . . full labor costs for first year or 50,000 miles, sliding percentage scale thereafter.



New! Styleside Pickups

Ford's Styleside Pickups, with 6½- and 8-foot bodies offer greater loadspace for '61—as much as 16% more! New one-piece cab-body design on longer wheelbases gives new comfort, greater durability. They're big in savings—as proved in certified studies of gas mileage and tire life. They're big in every way except in price—in fact, they're priced* as much as \$157 below other comparable pickups!

*Based on a comparison of latest available manufacturers' suggested retail delivered prices

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NEW SERIES . . . GVW'S
UP TO 51,000 LB.—
GCW'S UP TO 76,800 LB.**



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ROADS AND STREETS, December, 1960

**TURN PAGE
FOR MORE NEWS
ABOUT 1961
FORD TRUCKS**

FOR
1961

FORD TRUCKS

New! Space-Saving Tilts

Ford's popular Tilt Cab Series outsells all other makes and for good reason! Compact 82-inch BBC permits longer bodies for a given over-all length, and wide-track front axle makes it more maneuverable for congested area work. Simplified tilting mechanism exposes entire engine for money-saving ease of servicing. Ford offers the lowest-priced* tilt-cab model in the industry!



New! 4-Wheel Drive Pickups

Ford offers the lowest-priced* 4 x 4 with big 8-ft. box. And these models have the getup and traction to go most anywhere . . . road or no road! You can choose the gas-saving 135-hp Six, or the 160-hp V-8 that gives extra power and smoothness with "six-like" economy.

New! Durable Tandems

Ford's Tandem Axle trucks for '61 are engineered to give you greater flexibility and significant payload advancements. Your choice of 22,000-lb., 28,000-lb., 30,000-lb., 34,000-lb., or 38,000-lb. axle capacity. New, longer wheelbases are available to permit installation of special bodies up to 21 feet long. Aluminum walking beams as well as aluminum wheels and gas tanks are optional to keep chassis weights low and payloads high.



New! Econoline Pickup

Modern cab-forward design pares away 1,000 lb. of dead weight, yet you get as much payload capacity as standard $\frac{1}{2}$ -tonners! It's three feet shorter, yet there's a big 7-ft. box with 73 cu. ft. of load-space! You get lively performance and proven gas economy with the popular Falcon Six. And, the best news, Ford's Econoline Pickup is America's lowest-priced* pickup—bar none!

New! Falcon Pickup

Ford's Falcon Ranchero is priced* as much as \$231 less than leading conventional pickups—but initial cost is just the beginning of your savings! Certified tests by independent experts show gas mileage with the 85-hp Six as high as 30.5 mpg. You only change oil every 4,000 miles, and aluminized mufflers last up to three times as long. New, high-performance 101-hp Six is optional.



*Based on a comparison of latest available manufacturers' suggested retail delivered prices.

OFFER YOU GREATER ECONOMY AND DURABILITY IN EVERY WEIGHT CLASS

New! Super Duty Extra Heavies



Ford's Extra Heavies are built for unprecedented durability! Double-channel frames for truck models and single-channel frames of high-tensile steel for tractor models have been designed to provide proper strength with minimum weight. Huskier axles, wider power train choice, short 28-inch front axle setting, plus new high-durability cabs and sheet metal are typical of the advancements that add up to greater earning power for you.

New! Diesel- or Gasoline-Powered Tractors

Ford's new H-Series tractors with 28-inch front axle setting and 82-inch BBC are offered in four diesel and four gasoline models with over 500 engine-axle-transmission combinations. Pull longer trailers and bigger payloads! Choose from ten industry-accepted engines—five Cummins diesels and five Ford Super Duty V-8's!



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try, for service on all Ford
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ROADS AND STREETS, December, 1960

Firestone's Giant Tire Service keeps the wheels rolling.

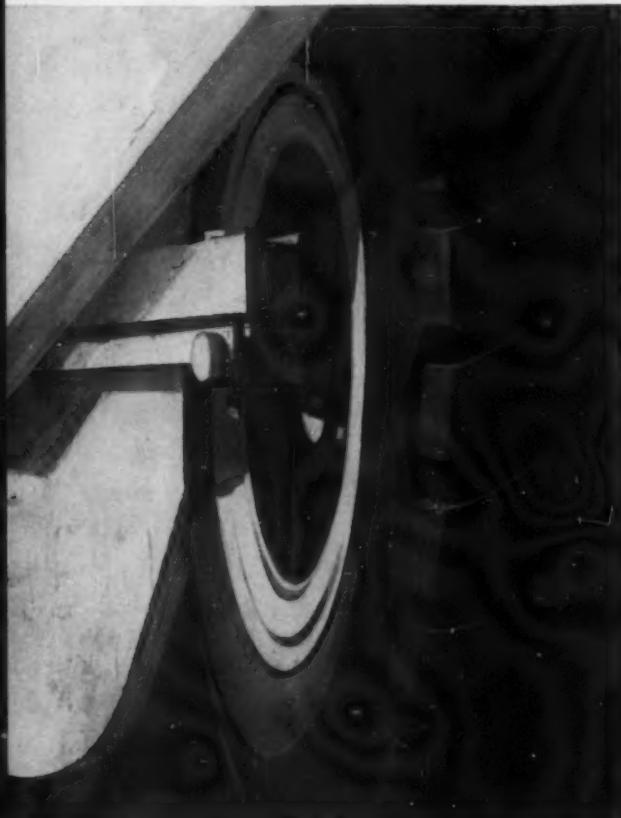


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 Colorado, Denver..... AC 2-0676
 Connecticut, Hartford..... BU 9-1551
 Florida, Jacksonville..... EL 4-1414
 Miami..... OX 1-0980
 Georgia, Atlanta..... CE 7-1531
 Hawaii, Honolulu..... B-3841

Illinois, Chicago.....	WA 2-1515	North Carolina, Charlotte.....	.EX 9-5461
Peoria.....	037-7721	North Dakota, Fargo.....	.AD 5-8448
Indiana, Indianapolis.....	ME 7-5481	Ohio, Akron.....	.JE 5-4925
Iowa, Des Moines.....	AM 5-0395	Cincinnati.....	.PA 1-0816
Kansas, Kansas City.....	HA 1-5542	Cleveland.....	.BE 4-2012
Wichita.....	LY 1-3405	Columbus.....	.AM 7-6333
Louisiana, New Orleans.....	JA 5-8227	Oklahoma, Oklahoma City.....	.JA 5-0461
Maryland, Baltimore.....	PL 2-3500	Oregon, Portland.....	.MO 5-0181
Massachusetts, Boston.....	AV 2-0810	Pennsylvania, Harrisburg.....	.CE 8-7244
Michigan, Detroit.....	WO 3-1060	Philadelphia.....	.SA 7-2800
Grand Rapids.....	GL 1-2911	Pittsburgh.....	.MO 1-2100
Minnesota, Minneapolis.....	ST 8-2466	Tennessee, Memphis.....	.WH 8-4443
Missouri, St. Louis.....	PE 1-0800	Nashville.....	.CY 1-4122
Nebraska, Omaha.....	733-4114	Texas, Dallas.....	.FL 1-9901
New Jersey, Newark.....	MA 2-6250	Houston.....	.WA 3-7036
New York, Albany.....	HE 6-0701	San Antonio.....	.CA 7-7375
Buffalo.....	TX 8-0803	Utah, Salt Lake City.....	.EM 4-5626
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You know how expensive tire downtime can be! The answer: keep it short. And with a Firestone Tire Expert on your project, it will be short. He'll do the worrying for you. He'll keep the correct pressure in the tires for every condition. Many times, he'll put the finger on trouble before it happens. But if trouble happens fast, he'll fix it fast. He can match new tires to any job, any rig—tires built with Firestone Rubber-X, the longest-lasting rubber ever used in Firestone tires plus the extra strength of Shock-Fortified nylon cord. So let Firestone take some of the risk out of those low bid jobs. Firestone Giant Tire Service is one of the best hedges against deadline pressure.

*Firestone T.M.

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ROADS AND STREETS, December, 1960

People

H. F. Clemmer Was Materials Engineer Dean

Harold F. Clemmer, who served for 29 years as engineer of materials for the District of Columbia highway Department, died at age 72. He had retired from Government service last year, serving since as a consultant to the highway department and to other groups.

Following graduation in 1912 from Iowa State University, he served his school as an associate professor of civil engineer, then became engineer of materials for the Illinois highway department. Later, he served as technical adviser to the Solvay Process Co. in New York before coming to Washington.

Mr. Clemmer was author of many technical papers and active in engineering and professional organizations, having served as chairman of numerous national committees.



Harold F. Clemmer

E. J. Thomas Heads Auto Safety Foundation

E. J. Thomas of Akron, Ohio, board chairman of Goodyear Tire and Rubber Co., was elected chairman of the board of trustees of the Automotive Safety Foundation at its 23rd annual meeting of trustees, held recently in Detroit. He succeeds Stanley C. Hope, former president of Esso Standard Oil Co.

Elected as foundation vice-chairman were J. N. Baumann of Cleveland, president, White Motor Co., and J. W. Keener of Akron, president of B. F. Goodrich Co. L. Walter Lundell, president, C.I.T. Financial Corporation, New York City, was elected treasurer. J. O. Mattson continues as president of the Foundation, with headquarters at 200 Ring Building, Washington 6, D. C.

WILLIAM F. NORSWORTHY has been appointed assistant managing director of the Associated General Contractors' of America, Louisiana Highway and Heavy construction branch at Baton Rouge. Preston Eggers, Jr., continues as managing director.

Continued on page 30

BEST TRACK... BIGGEST SAVINGS

Allis-Chalmers boosts work hours, cuts costs with the best tractor undercarriage in the business. You get industry's toughest track...best designed track guards...certified, permanently lubricated truck wheels, idlers, support rollers.

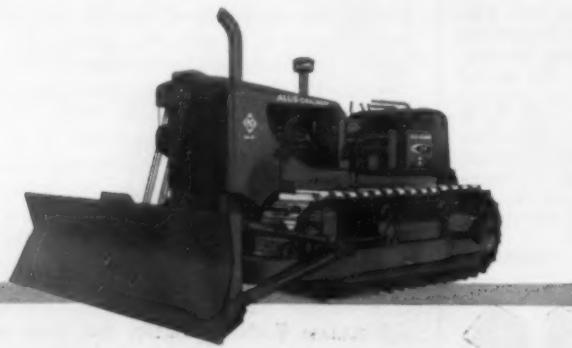
Next time you watch track shoes squeal and grind against jagged rock . . . or see 'em buried sprocket-deep in mud, consider this: Nothing slugs it out with tough conditions like an Allis-Chalmers tractor undercarriage.

Specially heat-treated track shoes, side bars, track pins and bushings are the industry's toughest. Bushings extend into counterbored side bars to seal out dirt, provide more bearing area.

Track guiding truck wheel guards provide a deep-flanged guide channel that keeps track riding true on sprockets, idlers and truck wheels even in the roughest and toughest going. The solid A-frame holds the truck frames in absolute alignment — keeps track running straight.

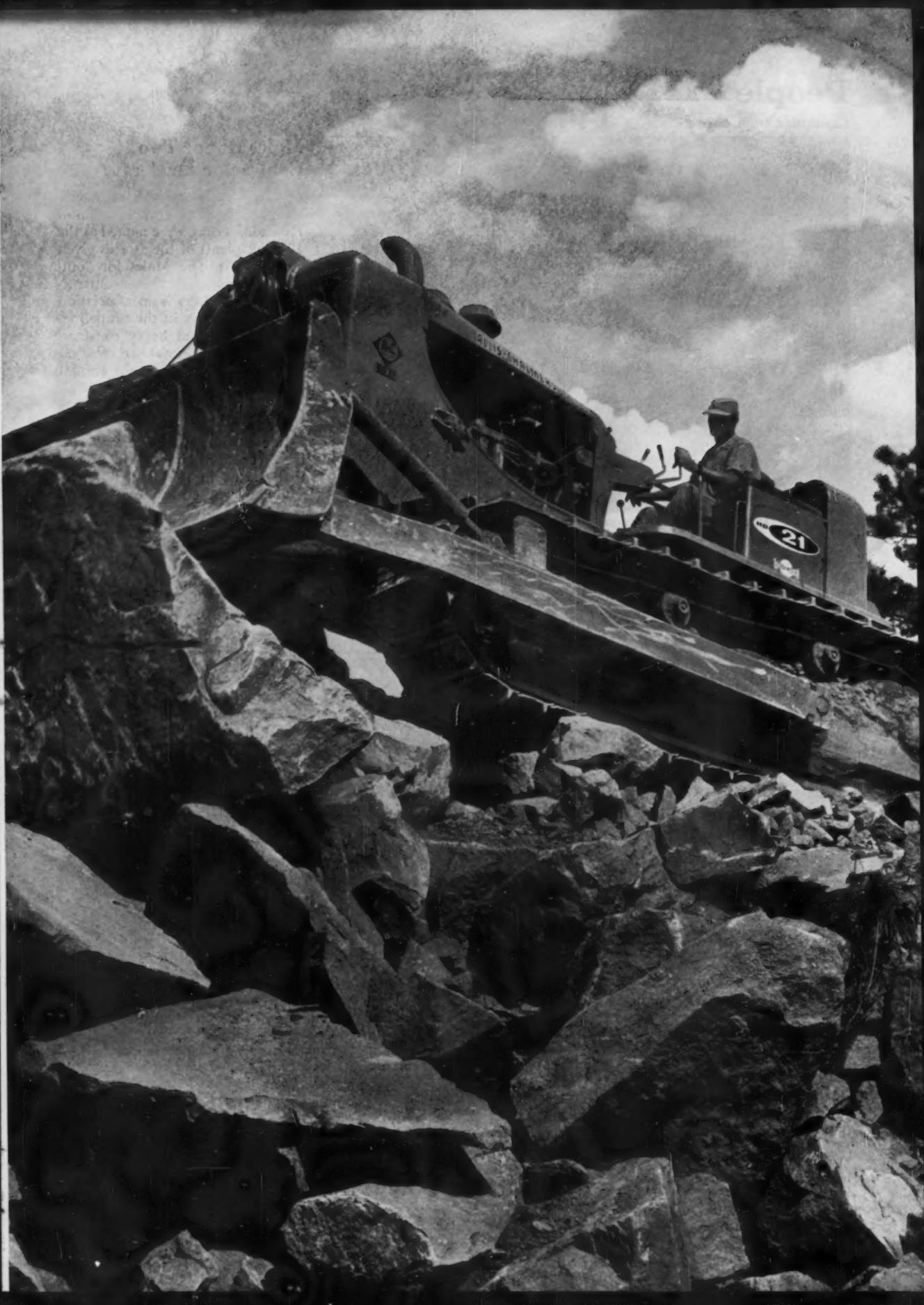
PERMA-SAFE truck wheels, idlers and support rollers on all Allis-Chalmers tractors roll on tapered roller bearings, are protected against dirt and moisture by Positive Seals. Factory-lubricated, they're certified never to need further greasing.

We invite a maintenance cost comparison with any other tractor undercarriage. We further invite you to inspect the Allis-Chalmers healthy, long-lived tractor engine, the all-steel main frame, double-reduction final drives and many other cost-cutting features. Your Allis-Chalmers dealer will be happy to give you full details. Allis-Chalmers, Construction Machinery Division, Milwaukee 1, Wisconsin.



move ahead with
ALLIS-CHALMERS
power for a growing world





People

Continued from page 27



Seen at the Highway Directors' Session of the AGC's Midyear Board Meeting in Phoenix: M. Clare Miller, San Ore Construction Co., Inc., McPherson, Kan., AGC's president-nominee for 1961; Erskine Stewart, vice-president, Better Highways Information Foundation, Washington, D. C., who addressed the group; George M. Williams, assistant commissioner for engineering, Bureau of Public Roads, Washington, D. C., who presented a paper on "Inspection and Testing Procedures on Federal-Aid Highway Projects," and H. L. Reyden, Reyden Construction Co., Phoenix, Ariz., chairman of AGC's Highway Contractors' Division of the AGC, who presided over the session.

Moles Honor Two Contractor Leaders

Harry T. Immerman of Larchmont, N.Y., and Herman Brown of Houston, Texas, were named as the 1961 recipients of the awards given annually by The Moles for "outstanding achievement in construction." The Moles is an association of leading figures in the tunneling, dam-building and heavy construction industry. Formal presentation of the honors will be at the annual Moles' Awards dinner at the Waldorf Astoria Hotel next January 25.

Immerman and Brown make up the 21st pair of honorees in a series that started in 1941 and numbers among its winners former President Herbert Hoover, Robert Moses, Adm. Ben Moreell, Peter Kiewit, Harvey Slocum and Lou Perini. The award, considered the highest recognition that can be accorded for service to the American construction industry, is made annual-

Continued on page 32

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SOUTH: Warren Brothers Roads
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EAST: Sam Finley, Inc.
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"M"
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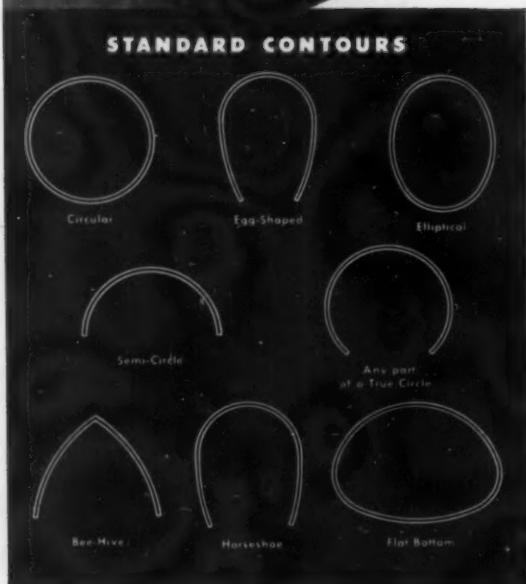
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Truscon Tunnel Liner Plates are used and accepted by leading engineers, and contractors in railroad, sewer, water, and highway tunnels. Tunneling avoids the high cost of destroying and replacing expensive pavements and track structure. Eliminates costly and troublesome detours. Keeps traffic flowing smoothly on busy highways.

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People

continued from page 30

ly to one member of the society and to one non-member.

Mr. Immerman, the non-member winner, is vice president and chief engineer of Spencer, White & Prentiss, Inc., having been with this large foundation and heavy construction company since 1923.

Mr. Brown is president of Brown & Root, Inc., a Houston enterprise that has grown out of a company he founded in 1914. The company has been responsible for more than \$2 billion worth of construction projects throughout the world.

L. M. HOSKINS, Chief, Division of Maintenance, Missouri state highway department since 1956, has retired. He is succeeded by F. L. Stuckey, formerly chief of the division of supplementary highways and local roads information.

Both men are veterans of nearly 40 years in the highway department.

Meetings

HIGHWAY RESEARCH BOARD—40th Annual Meeting, Sheraton Park Hotel, Washington, D.C.; January 9-13, 1961.

NATIONAL CRUSHED STONE ASSOCIATION—Annual Convention, Americana Hotel, Miami Beach, Fla.; January 17-20, 1961.

NATIONAL LIMESTONE INSTITUTE—16th Annual Convention, Statler-Hilton Hotel, Washington, D.C.; January 17-19.

13TH CALIFORNIA STREET AND HIGHWAY CONFERENCE—Presented annually by the Institute of Transportation and Traffic Engineering, and University Extension, University of California, held on University's Campus, Berkeley, Calif.; January 26-28, 1961.

NATIONAL BITUMINOUS CONCRETE ASSOCIATION—5th Annual Convention, Shamrock Hotel, Houston, Texas; January 28-February 1.

ASSOCIATION OF ASPHALT PAVING TECHNOLOGISTS—1961 Meeting, Hotel Francis Marion, Charleston, S.C.; February 6-8.

ASSOCIATED EQUIPMENT DISTRIBUTORS—Annual Convention, Statler Hotel, Los Angeles, Calif.; February 6-9.

AMERICAN CONCRETE INSTITUTE—57th Annual Convention, Chase-Park Plaza Hotels, St. Louis, Mo.; February 20-23.

ASSOCIATED GENERAL CONTRACTORS OF AMERICA—Annual Convention, Hotel Statler, Boston, Mass.; February 26-March 2.

AMERICAN ROAD BUILDERS ASSOCIATION—59th Annual Convention, Chalfonte-Haddon Hall, Atlantic City, N.J., March 5-8.

AMERICAN SOCIETY OF CIVIL ENGINEERS—Spring Convention, Hotel Westward Ho, Phoenix, Arizona; April 10-14.

WESTERN ASSOCIATION OF STATE HIGHWAY OFFICIALS—40th Annual Conference, Flamingo Hotel, Las Vegas, Nevada; April 23-28.

CONFERENCE ON PARKING—Georgia Institute of Technology, School of Civil Engineering, Atlanta, Ga.; May 18-19.

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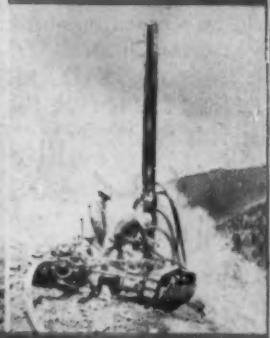
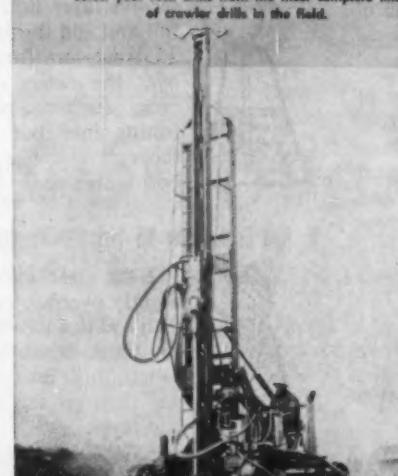
HANDY GUIDE TO HARDROCK DRILLING

Here's the most complete information on crawler drills ever compiled in one book. At your finger tips are specifications and charts for matching Gardner-Denver carriers, feeds, drills and accessory equipment—tailored to speed the job.

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ALPHA

BETTER CONSTRUCTION THROUGH
BETTER USE OF CEMENTS

news and notes from the field

The Right Way To Make a Slump Test

In many cases the acceptance or rejection of a load of concrete depends upon a one-inch variation in the slump. This much variation can be—and often is—caused by mistakes in making the slump test.

Sampling

If the slump test is to determine acceptability of the concrete, the sample must be taken from the early part of the load. Let out at least a wheelbarrowful before taking the sample. The first concrete out of the mixer should never be used for testing.

If the test is to be representative of the entire load, take samples from three parts of the load, directly from the mixer discharge. The total sample should be at least 80 lbs. and should be remixed in wheelbarrow before making slump.

1. Place Slump Cone on Plank, Slab or Steel Plate



Moisten the inside of the cone and place it on a flat, level, firm surface which extends several inches beyond the base of the cone. When putting concrete in the cone stand on the foot lugs to hold it firmly in place.

Reprints of the information on this page are available for the asking.

2. Fill Cone in 3 Layers



Fill the cone $\frac{1}{3}$ full and rod layer exactly 25 times with a round, bullet-nosed iron or steel rod of $\frac{5}{8}$ " diameter. Rod uniformly over the entire concrete layer.

3. Use Bullet-Nose $\frac{5}{8}$ " Rod



Fill the cone with the second layer until $\frac{2}{3}$ full and rod this layer 25 times uniformly over the entire concrete surface, penetrating into but not through the first or bottom layer.

4. Rod Each Layer 25 Times Uniformly



Fill the cone until it slightly overflows and then rod this top layer 25 times uniformly, penetrating into but not through the second layer.

5. Strike Off Excess Concrete



Strike off excess concrete from the top with a straightedge so that the cone is exactly full. Remove spilled concrete from around the bottom of the cone.

6. Remove Cone Carefully



Lift cone straight up, slowly and gently, immediately after filling, rodding and strike-off are completed. Never jar the concrete at this point.

7. Measure Slump From Bottom of Straightedge



Measure the slump as shown above. If the top of the slump is irregular, do not measure the high point or the low point. Try to get the average. Caution: Never reuse this concrete for cylinder strength tests.

Recommended Slumps for Various Types of Construction*

Type of Construction	Slump inches**	
	Maximum	Minimum
Reinforced foundation walls and footings, and thin plain walls.	5	2
Plain footings, caissons, and substructure walls.	4	1
Slabs, beams, and reinforced walls.	6	3
Building columns.	6	3
Pavements.	3	2
Heavy mass construction.	3	1

*Adapted from Table 4 of the 1940 Joint Committee "Report on Recommended Practice and Standard Specifications for Concrete and Reinforced Concrete."

**When high-frequency vibrators are used, the values given should be reduced about one-third.

ALPHA

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New Publications

Manual on Concreting

The Concrete Improvement Board of Metropolitan Detroit has published a manual on recommended concreting practices, developed primarily for the metropolitan Detroit, Michigan, area. The compilation covers general recommendations, exposed portland cement concrete residential paving, house basements, winter concreting, hot weather concreting, and includes a ready-mixed concrete purchase recommendation.

The compilation represents the cooperative effort of the various segments of the concrete industry in the Detroit area. It is intended as a practical guide to good practices.

The Concrete Improvement Board was established in 1954 with the basic objective to improve the quality of concrete construction in the area. The membership is made up of ready-mixed concrete producers, concrete masonry pro-

ducers, aggregate producers, general contractors, public building officials, consulting engineers, home builders, and architects.

The book with three-ring binder, 10 x 11-in. format is priced at \$1.75 for the special binder and \$0.50 for each recommendation: General Recommendation on Responsibility for Concrete Control, Sampling, and Testing Laboratories—3 pp.; Recommendations for Exposed Portland Cement Concrete Residential Paving—3 pp.; Recommendation for House Basements—7 pp.; Recommendations for Winter Concreting—2 pp.; Recommendations for Hot Weather Concreting—3 pp.; Ready Mixed Concrete Purchase Recommendation—2 pp.

Inquiries should be directed to Concrete Improvement Board, P. O. Box 4663, Mt. Elliot Post Office, Detroit 34, Michigan.

EFFECT OF WATER-REDUCING ADMIXTURES ON PROPERTIES OF CON-

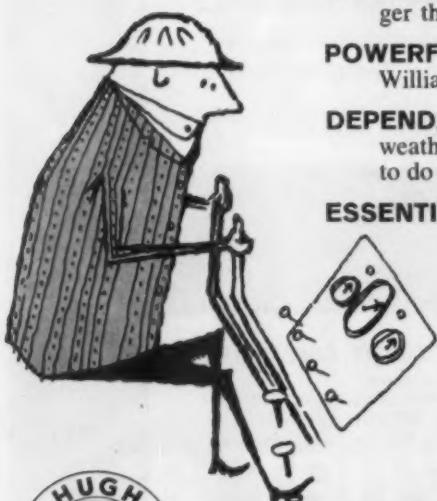
CRETE—Bulletin STP 266 246 + iv pages, Hard Cover, 6 x 9", \$7.50. American Society for Testing Materials, 1916 Race Street, Philadelphia 3, Pennsylvania.

The use of water-reducing admixtures and set retarders in concrete has grown continuously since their introduction over 25 years ago; present estimated usage: 25 million cu. yd. of concrete annually in the U.S. alone. Further indication of current interest is evidenced by the fact that ASTM Committee C-9 on Concrete and Concrete Aggregates and certain public agencies are actively drafting standard methods of test and specifications to govern the purchase and performance requirements of these admixtures.

The Symposium consists of ten papers and a summary. It is of interest to note that four of the papers represent the joint contribution of four principal producers of admixtures. The remaining papers were prepared by representatives of

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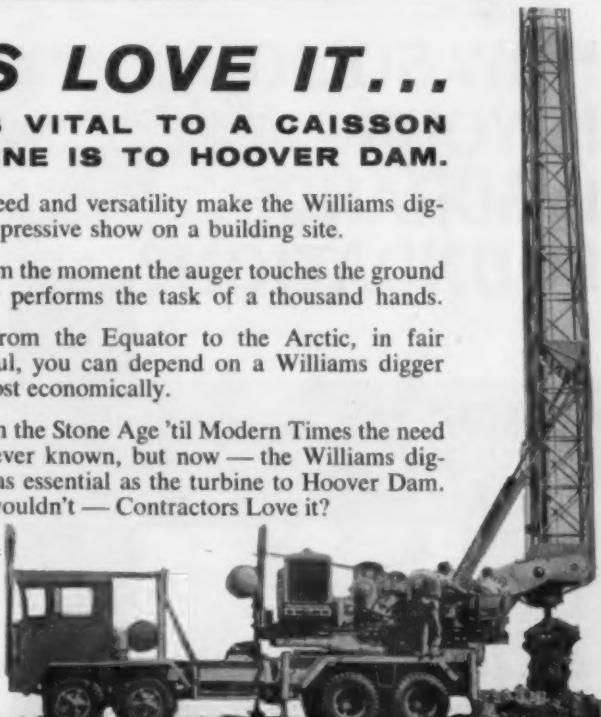


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consumer interests, research organizations and the cement industry. Extensive tabular material, charts and references are included in this volume.

Milestone in Soil Mechanics Publications

From Theory to Practice in Soil Mechanics. Selections from the writings of Karl Terzaghi, with bibliography and contributions on his life and achievements, prepared by L. Bjerrum, A. Casagrand, R. B. Peck, and A. W. Skempton. 425 pages; 8½x11; cloth bound. \$12.00. John Wiley and Sons, Inc., 440 Fourth Avenue, New York, New York.

This book compresses into one volume the thinking and life work of a man who has exerted a unique influence on the branch of engineering science known as soil mechanics. Included here is a selection of papers among which those which served to establish this science and a selection of his professional reports that indicate his methods of dealing with specific

jobs together with a complete bibliography of his works.

Some of the papers contained in this volume have previously been difficult to find in literature, and others have been translated specifically for this book. Together they provide a special insight into how Terzaghi approached and solved foundation, landslide, tunneling and earth-dam problems.

Symposium on Treated Wood for Marine Use; STP 275, 70 pages, hard cover, 6" x 9", price \$2.50. American Society for Testing Materials, 1916 Race Street, Philadelphia 3, Pennsylvania.

A major problem around salt water and especially in maintenance, is the prevention of marine borers from seriously shortening the life of wood piling. Treatment with creosote and other coal-tar solutions has long been considered the most effective means of marine borer protection. Even this type of treatment has not been fully effective. Consequently, research continues in the attempt to solve this costly problem. ASTM Com-

mittee D-7 on Wood in recognition of the problem has sponsored the 7-paper symposium covered in STP 275.

HIGHWAY NEEDS AND PROGRAMMING PRIORITIES. Bulletin 249, Highway Research Board, 2101 Constitution Ave., Washington 25, D. C. Price \$1.80. The publication contains the following reports:

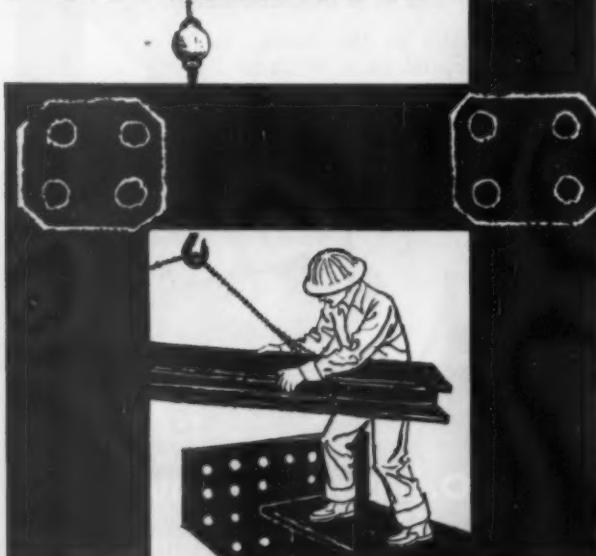
The Congestion Approach to Rational Programming, by Evan H. Gardner, Pennsylvania Department of Highways; Advance Programming Methods for State Highway Systems, by James O. Granum, Automotive Safety Foundation, and Clinton H. Burnes, Bureau of Public Roads; A Criterion Designed to Aid Highway Expenditure Programming, by Charles M. Hummel, Davidson College, Davidson, N. C.; and Estimation of County Primary Road System Needs by Sample Survey Methods, by Donald O. Covault, Georgia Institute of Technology, and Harold L. Michael, Joint Highway Research Project, Purdue University.

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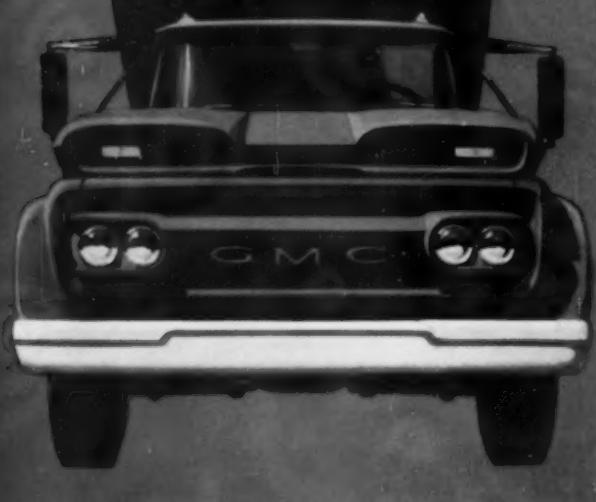
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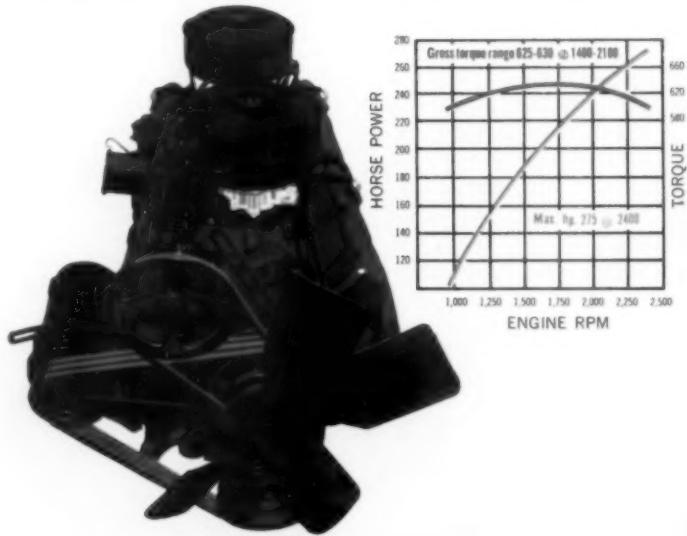


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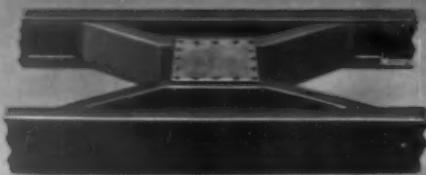


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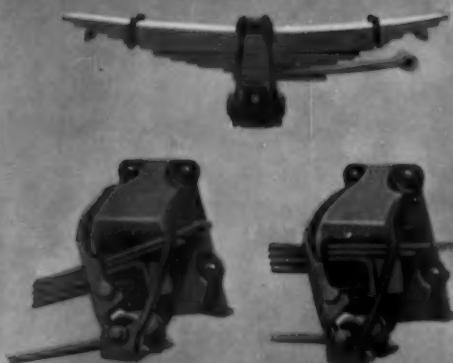
EXCLUSIVE V-6 POWER FOR BONUS EARNINGS ON EVERY HAUL		
Model	Gross Torque Range	Max. Horsepower
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351	308-312 @ 1400-2400	180 @ 3400
401	375-377 @ 1200-2000	210 @ 3400



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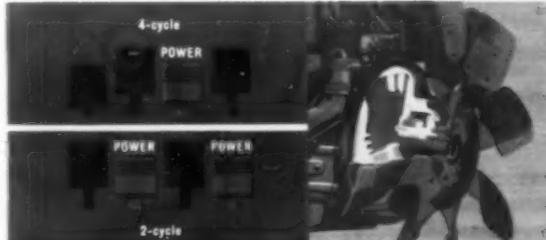
PERFORMANCE-MATCH YOUR DIESEL POWER NEED

Model	Max. Torque	Max. Horsepower
6V-71	577 @ 1200	189 @ 1800 to 210 @ 2100
	604 @ 1200*	197 @ 1800* to 218 @ 2100*

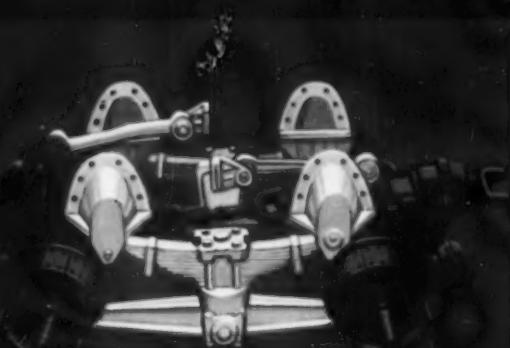
*At sea level



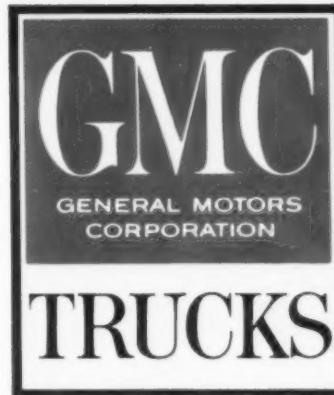
Smoother, faster acceleration GMC's two-cycle design delivers power on every downstroke of every piston . . . twice as often as in a four-cycle engine. There are no wasted strokes, no power lags.



Save up to 5% on fuel, release up to 7% extra horsepower to the drive wheels automatically with this hydraulically-controlled fan. Standard equipment only on GMC diesel-powered trucks.



More payload, less service is possible with these GMC tandems due to simplified, lightweight design. Greater stability with lower center of gravity. Longer axle and tire life with 50% load on each axle at all times. Four-point mountings eliminate concentrated frame stresses.



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Engineering Contractors

As highway contracting grows, its company owners find themselves drawn closer and closer to the engineering requirements of the job. Any dirt mover could build a fill with mule teams when no compaction or soils control was required. Not so with modern roadway embankments—or with meeting toughen tests and specifications on many phases of highway and heavy construction today. Meeting these requirements, plus the work of job planning, estimating and cost control, requires increasingly the employment of engineers in the company management.

For this reason many a contractor can draw inspiration from Stephen D. Bechtel, of the global Bechtel Corporation, San Francisco, who won the coveted John Fritz Medal this year. This highest of professional honors, sponsored each year jointly by five engineering societies, was presented to Bechtel at the recent Boston convention of the American Society of Civil Engineers.

In his brief acceptance speech Bechtel dwelt on the theme of engineering construction, and the role of the contractor in the emergence of construction as one of the great basic industries. He spoke with pride in being himself an engineer (he is a Fellow

in ASCE). And he noted that engineers have always made up about fifty percent of his company's permanent staff.

This construction leader sees a growing interdependence between the construction and the engineering function. He sees a sharpening need to better integrate the two functions in the services expected of the contractor.

While this international contractor's work has been chiefly outside the field of highways, his utterance at Boston seems a particularly timely one for road builders. Everywhere we turn today in the highway program the contractor has a more technical job to do. Company leaders who are themselves engineers or who keep experienced engineers on the payroll are often best able to plan and carry out work efficiently, with least trouble with the inspectors and the boys in the testing lab.

Who knows, perhaps some day contracting organizations may be invited now and then to provide the complete highway, from location and design through construction and including most of the job supervision. It's been done successfully in defense work, and is being done today on some of Europe's new super-roads.

Harold J. McKeever

Rock work never stopped through the cold 1959-60 winter on Pittsburgh airport. Here a Marion 111-M with Esco bucket is loading a B Tournarocker for the mile-haul to a 90-ft. fill in the distance. Note tight, smooth haul road and clean working floor, part of the Harrison technique. →

8,000,000 Yard Grading Job for a Single Airstrip

Vibratory compaction is among methods used by Harrison Construction Company on unprecedented project at Pittsburgh

This winter will see the completion of a grading job that sets a record for yardage required for a single runway, at least as far as U.S. civil aviation is concerned. The project is for the new East-West Parallel Runway which will help expand the Greater Pittsburgh Airport to handle its zooming jet-age patronage. The \$12 million project is part of an improvement program being carried out by the Allegheny County Department of Aviation.

Harrison Construction Company, of Pittsburgh, has been working on a \$5.6 million grading contract for the airstrip since April, 1959, and will move equipment soon for \$2.3 million paving work won in recent weeks. Ernst Electric Construction Co. has the \$600,000 runway lighting job.

The grading contract took in some road relocation and such "off beat" items as mining coal seams, removing coal mine waste, and plugging several oil wells, and relocation of gas, electric and gasoline utility lines in the area. Also extensive storm drainage including a \$1.6 million job of enclosing five creeks in large cradled pipes—this part to be reviewed in a later report.

This summary deals with the "main show"—the work of leveling a 16,500 ft. long strip of hilly terrain for a new 10,500' x 150' runway, parallel taxiway, turnouts, warmup areas and approach zone.

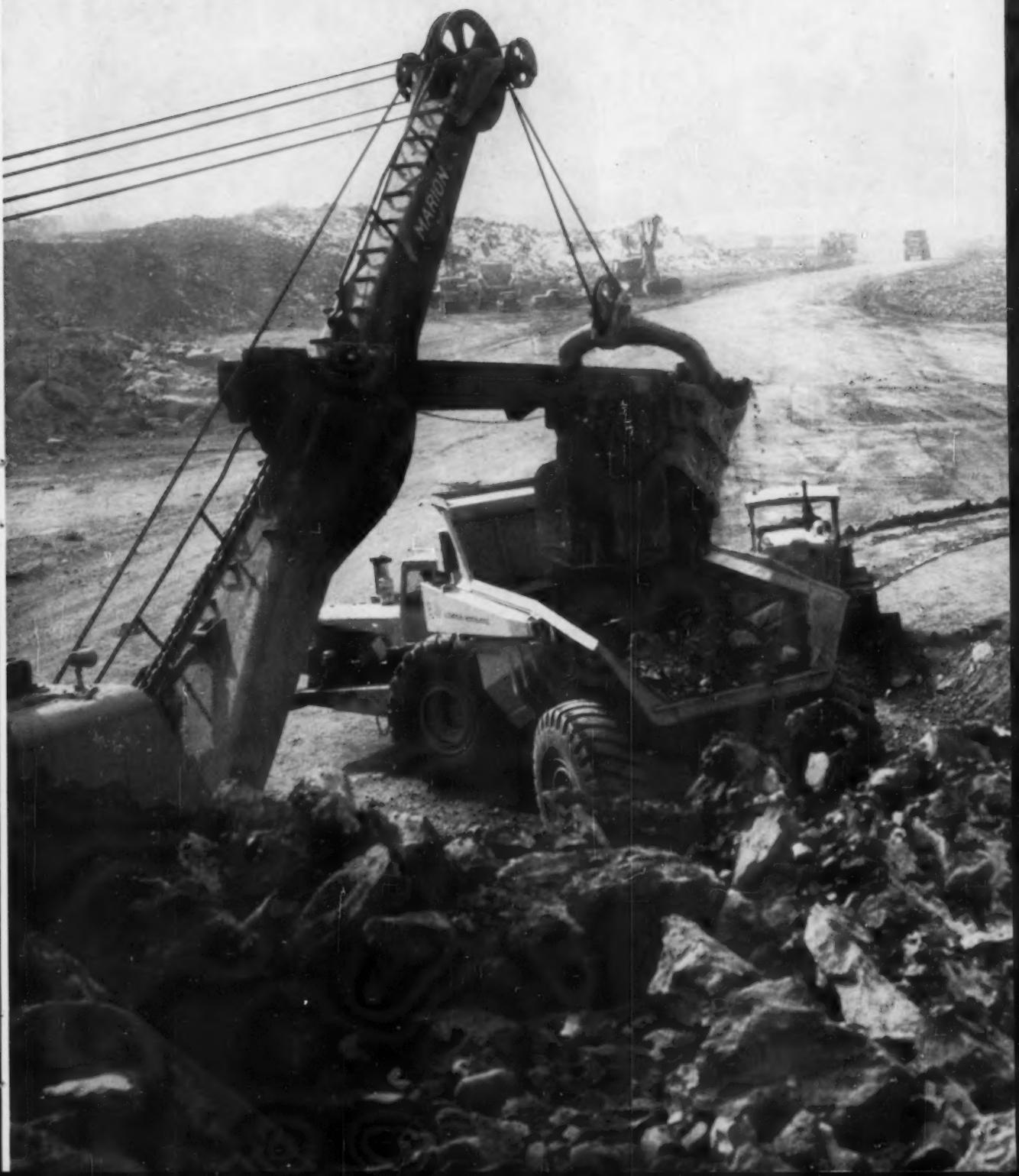
The grading work despite the numerous extra items and proximity to the operating terminal was not hampered severely by these circumstances which often make airfield extension work a slow job. The contractor's chief overall planning problem was to develop the best possible data on the nature and location of

various types of soils and rocks that would be suitable for filling; and to plan the work with minimum haul and with seasonal aspects in mind. Since the job was to extend through a winter and the following year, the first summer's grading had to be planned with an eye to opening up ample shovel work for the 1959-60 winter and spring when moisture and frost would severely restrict movement of scraper dirt.

The pattern of cuts and fills was unusually simple for an airfield job of this acreage; principally four cut areas with depths up to 80 ft. maximum, and three large fills, up to 90 ft. maximum. During the first summer, grading was restricted largely to a 5,000 ft. zone which took in one-way hauls out of the big central 5.1 million cu. yd. cut area. This restriction was decided upon due to a delay in the availability of some of the federal funds involved.

The Harrison low bid was based on a long familiarity with the local terrain (this firm helped build the original airfield), and also on borings which the firm took to augment the engineers' subsurface data. The scraper material included some loam, yellow clay and blue slatey material. The rock included limestone, sandstone, shale and mudstone in approximately level strata, with coal seams in some locations. About one-third of the yardage has required shovels.

Beginning in April, 1959, clearing crews tackled the 220 acres of brush and light timber removal, using heavy tractors fitted with Rome plows and brush rakes. Debris could not be burned due to the nearness to airfield operations and because of Pittsburgh's smoke-control laws. Refuse was decked along the edge of





The bulk of the compaction work at Pittsburgh airport has been done by Cedarapids Model 60, 60,000-lb. compactors. These machines covered rock as well as earth lifts. Note tire marks from initial passage over dirt, done in conjunction with dozer spreading and motor grader manipulation.

fill areas for rotting during the period of the grading.

Also launched then was the scalping of topsoil and removal of muck from creek-bottoms where pipes would have to be placed on schedule. About 25,000 cu. yd. of organic material was wasted as a pay item. Dozers were used along with a dragline for this work.

Steady Grading Pace

Earthmoving which began in mid-May of 1959 was planned around an equipment spread which took in two 4½-yd. shovels, a 3½-yd. shovel, 11 rear-dumps, 13 bottom-dumps, 2 belt loaders, 14 large tractor-scaper units, 12 tractors, 2 large truck-mounted rotary drills, 2 Model 60, 60,000-lb compactors, and supporting equipment—some 100 units at peak including the subcontractors' equipment.

With this equipment the yardage soon came fast, and a steady 25,000 to 30,000 cu. yd. pace (two 10-hour shifts) was maintained throughout the 1959 summer with a peak of 42,000 cu. yd. By September 15 (when the federal grant was cleared and the job opened up), about 2½ million cu. yd. had been placed in the fills.

As can be surmised on a grading job stretched out along three miles, haul was a critical job factor. The

average haul was estimated at 4,000 ft. one way, but considerable material required much longer hauls. As the 1960 summer drew near, with another peak of production required, the contractor had the area flown and aerial maps prepared, as a basis for study of various haul plans. Shovel and scraper work based on this fresh analysis built up again to about 30,000 cu. yd. per day maximum with 3½ million cu. yd. moved between May 1st and October 1st, 1960. This left only some 15 percent of the yardage for cleaning up in late autumn or for scheduled completion in April, 1961.

Moving of soil materials utilized two basic spreads. During the 1959 season, and for a time in 1960, Euclid loaders and bottom-dumps handled fill placement for longer hauls. Elsewhere, working in various combinations the scrapers made an excellent showing. Interest was centered in the company's ten MRS units, three of which were the big 250s, rated at 45 cu. yd. heaped capacity and equipped with Goodyear's biggest tires (37.5 rear and 33.5 front). The MRS 200s handled 38 cu. yd. loose loads. Pusher service was by Caterpillar D9 or Euclid TC12. Euclid twin-engine TS24 scrapers worked shorter hauls, with or without pushers. Load-

Continued on page 88

**Heap It Some More?
Or Raise Pan and Get Moving?**

How to Figure Your Best Scraper Loading Time

By R. L. Peurifoy
(Construction Consultant, Bryant, Texas)

Do you struggle to get the maximum possible load in the scraper of your hauling unit? If you do, you may be robbing your equipment of a higher potential production. While the scrapers of your hauling units have given capacities, usually specified as struck and heaped, it may not be good business to load them to the maximum possible capacities. With the trend toward bigger scrapers and loads, this statement may appear to be questionable, but a look at the results of studies of economic loading time will reveal the soundness of the statement.

The information which appears in this article was developed from a series of field tests that were conducted to determine the effect of varying the loading time on the production of hauling units. The equipment used and the job conditions were as described hereafter.

Job Conditions:

Earth-sandy clay—average weight 3,050 lb. per bank cu. yd.; swell 33 percent.

Haul distances—varied from 500 ft. to 10,000 ft.

Haul road—firm and well maintained—rolling resistance 65 lb. per ton—grade 2 percent adverse for loaded units.

Combined resistance of haul road—for loaded units, 105 lb. per ton—for empty units, 25 lb. per ton, average.

Equipment:

Pusher tractor—335 hp. crawler, equipped with power shift.

Hauling unit:

Tractor—two-wheel with 345-hp. engine.

Scraper capacity—struck, 19.5 cu. yd.; heaped, 27 cu. yd.

Combined operating weight—60,000 lb.

A single push tractor was used to assist the hauling units while loading, and to give them boosts as they left the borrow pit. Loading times were varied in steps of 0.1 min. from 0.5 min. to 1.4 min. The loads hauled were determined by weighing the loaded haul units. Figure 1 shows the results of this test. As shown in this figure, loading was relatively fast for the first 0.5 min., or until a scraper load reached about 17 cu. yd., after which the rate of loading decreased rapidly.

This curve is referred to as the *load growth curve*.

The reduction in the rate of loading is the result of the loading resistance, which increases as the load gets larger. The question which concerns every contractor is whether it is good practice to load a scraper to its maximum capacity. Generally it is *not* good practice. Contractors want the highest possible production per hauling unit, which, with other factors remaining constant, will give the lowest production cost.

How is the maximum production obtained?

An analysis of the payload vs. loading time, the cycle time, and the hourly production per hauling unit will illustrate how the most economical loading time may be determined. The following calculations are for a 2,500-ft. haul road, and for job conditions previously stated. For other haul distances and job conditions, the results can be determined in a similar manner.

Conditions:

Haul distance—2,500 ft.

Hauling resistance:

Rolling resistance = 65 lb. per ton

Grade resistance = 40 lb. per ton

Total resistance = 105 lb. per ton

Returning resistance:

Rolling resistance = 65 lb. per ton

Grade advantage = 40 lb. per ton

Total resistance = 25 lb. per ton

Weight on hauling unit, for 19-cu-yd load:

Hauling unit = 60,000 lb. or 30 tons

Load, 19 × 3,050 = 58,000 lb. or 29 tons

Total weight 59 tons

Rimpull required, loaded, 59 × 105 = 6,190 lb.

Maximum speed, 13.8 mph

Probable speed, 0.9 × 13.8 = 12.4 mph

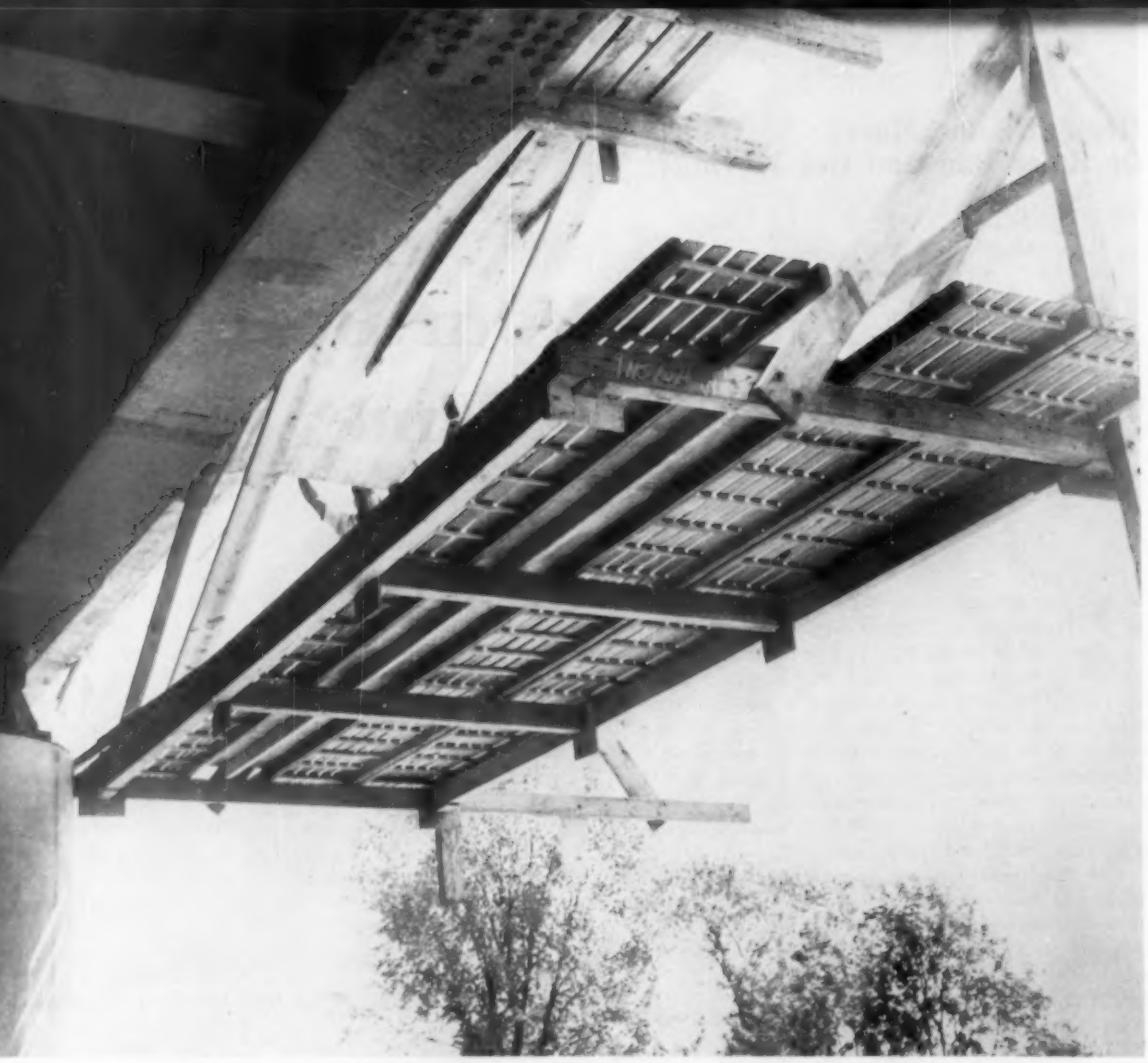
Rimpull required, empty, 30 × 25 = 750 lb.

Maximum speed, 22.6 mph. Use this speed.

Cycle time, less loading time:

Hauling, $\frac{2,500}{12.4 \times 88} = 2.3$ min.

Continued on page 74



From underneath structure, here's how trailer-mounted rig looks (men are stripping form, upper left). Flooring consists of light painters' ladders, with light boards across rungs, providing an 8-ft. working platform.



Topside view of trailer that mounts "offside" form stripping rig. Trailer is towed by truck to proper spot, carrying side assembly with it.

DeLuxe Traveling Rigs Help Set and Strip Bridge Deck Forms

Forming operations—particularly a couple of ingenious job-built devices for placing and stripping—were the key to the fast deck paving on the new Woodrow Wilson (Jones Point) bridge south of Washington, D. C.

The problems were basically two familiar ones: To place, and later strip, formwork for a 6-ft. cantilevered concrete sidewalk overhang on either side of the 5,900 ft. structure; and to place and strip job-built plywood forms for paving the two 38-ft.-wide roadways.

To speed this deck job, McCloskey Enterprises, Inc., holder of the \$1.4 million paving contract, developed with affective refinements a trailer-mounted rig that "overhung the overhang" and could be towed along the bridge roadway for stripping. Also devised was a cable-slung platform that could be suspended below the heavy bridge I-beams (3 ft. web) and could be pulled along (by hand) under the roadway forms for placing and stripping.

The bridge itself, one of four under construction or projected in the Washington, D. C., area will be a link in the long-planned Washington Circumferential Highway.

About 3,500 ft. of the total abutment-to-abutment length is over water, the remainder on land piers on the Virginia side. Near the center, twin double-leaf bascule spans will provide 175 ft. clear channel with 52 ft. vertical clearance at mean high water. The deck height above ground levels varies up to about 70 ft.

Paving Plan. The twin 38-ft. roadways consist of reinforced concrete deck slabs with a 2-in. asphalt topping. The slab depth varies from 9 in. at the outer edges to 7 in. near the median.

The contractor placed pavement virtually on a "hand" basis. Concrete was delivered by truck, spread by laborers and vibrated in place with small, gasoline power hand vibrators, and broomed for a roughened surface to take the asphalt covering.

Of interest is the fact that there are no defined joints between pour sections of the concrete paving. For example, the south roadway out to the bascule spans was placed in alternate blocks about 40 ft. long, each the full width of 38 ft. The gaps were then filled without joints.

On the north roadway, McCloskey started a different pattern. Half of the 38-ft. width was paved in one operation, against a temporary dam (see pictures) of plywood chips stuck between the reinforcing bars. Then the other half was paved, again without any actual joint.

Engineers say that a 1-in. expansion joint running under the median will take care of any expansion horizontally, while finger-dams placed at every third row of supporting columns will take care of longitudinal expansion.

The bascule spans will have a cast-iron grating as pavement.

Formwork Rigs. Formwork for the main slab, atop the main girders, were of conventional design plywood assemblies hung from the tops

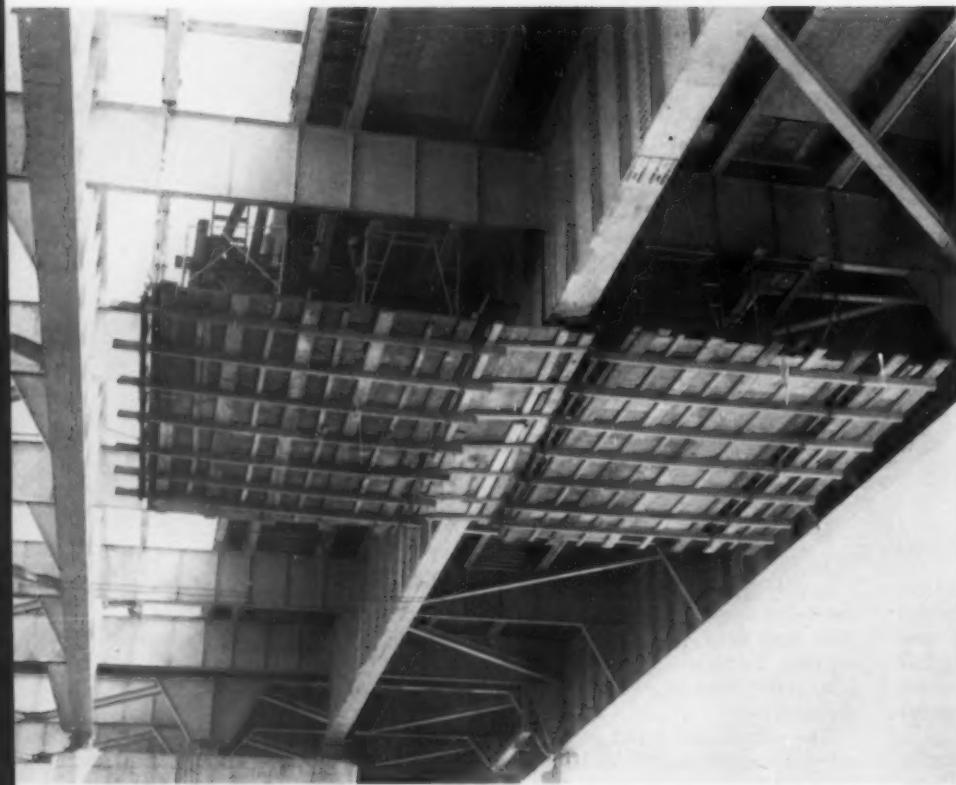
of the I-beams by Richmond form ties. Forms were made up of $\frac{5}{8}$ -in. plycord backed by 2 x 4 braces. But the rig built to aid placement and stripping of these forms was noteworthy. It consisted of a movable platform hung on two 6-in., 30-ft.-long I-beams, to which were fixed a series of crosswise 4 x 6 stringers. These stringers, in turn, carried a $\frac{5}{8}$ -in. plywood "floor" that could support workers and pipe-scaffolds or ladders to reach the underside of the formwork.

The whole platform, 30 ft. long by 16 ft. wide (distance between the girders), was suspended from a lower girder flange by cables spliced to job-built clamps that hooked over the flange. Working height of the platform (distance below the forms) was adjusted by individual "come along" grippers affixed to each cable, so that the platform could be leveled, raised or lowered as required.

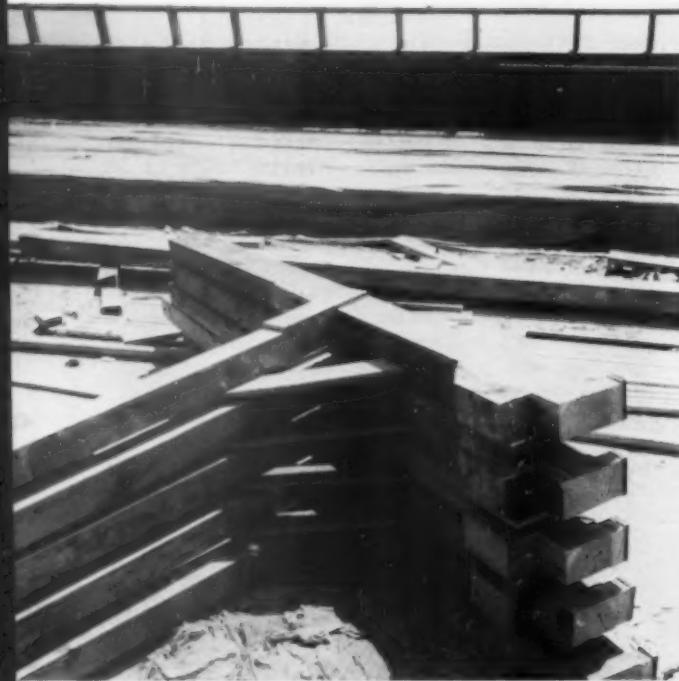
At the lower end of the suspending cables, another clamp was built to fit over the top flange of the small I-beams that supported the platform. The underside of this lower clamp was fitted with rollers. Thus, when moving the platform forward or backward, the outermost set of clamps was moved, placed ahead of the platform in the direction of the move, and the whole rig thus made to slide forward to a new location.

McCloskey used two such rigs for all of his work, progressing across the river and back.

Deck Overhang. To take care of form stripping under the cantile-



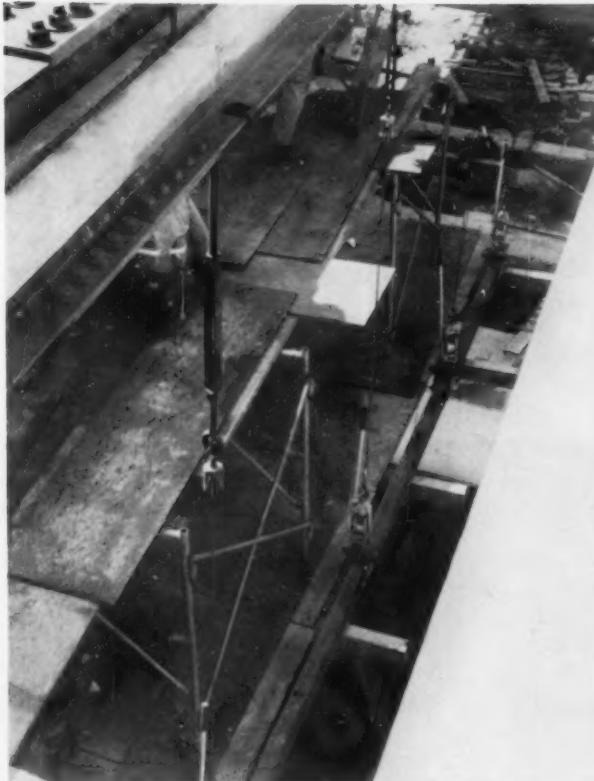
From underside, platforms hang under main girders (south half of bridge deck is being paved here).



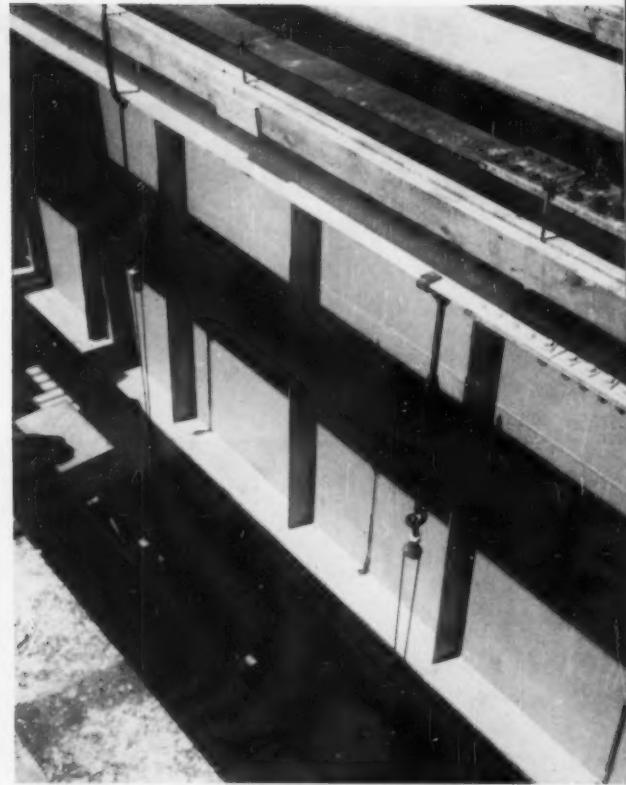
Braces for cantilever forms are prefabricated on the bridge deck, ready for use. Top member is a 4 x 6, 7 ft. long, diagonal member is 4 x 4.



Part of contractor's "mechanized paving train"—two workers, with portable vibrator. Most of paving operation is done by hand methods.



Looking down through bridge girders at suspended platform used to place and strip slab forms for main pavement. Circled area is clamp and suspender assembly, to which are fixed cables that support platform below.



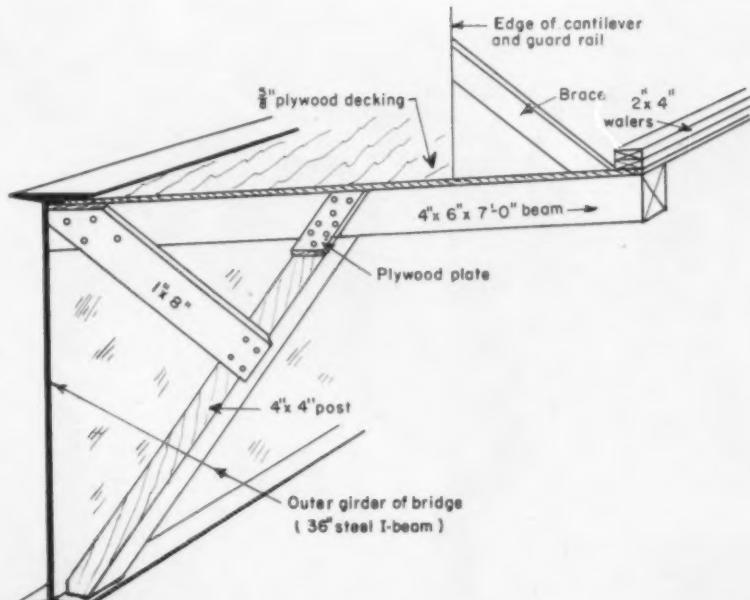
Another view of suspension system. Water is 80 ft. below.

vered sidewalks, McCloskey's General Carpenter Foreman, James V. Ellis, built two trailer-mounted rigs that could be towed along the bridge roadway for spotting as needed.

The rigs each consisted of an 8-ton Freuhauf rubber-tired trailer, with an additional 1,800-lb. concrete counterweight on its inner side. The trailer was 21 ft. long, 8 ft. wide, or large and heavy enough to function efficiently. Fixed to the top of this trailer, projecting at right angles to its axis were double 2 x 12 planks, one at each end. When the trailer was parked along the outer roadway curb line, the ends of these doubled planks projected about 5 ft. beyond the cantilevered sidewalk slabs.

From the outer ends of these planks, 1 x 8 planks 15 ft. long were framed to extend straight downward; and inward from these, a 4 x 6 post was also fixed to extend downward. These two braces were

Continued on page 101



Assembly for supporting forms for cantilevered sidewalk.

MILE-HIGH CALIFORNIA ROAD JOB

NEW TRACTOR- REALLY



Packs it in—two D8H Tractors, pulling and pushing, fill a 491 Scraper with hard-to-load breccia, a cemented gravel, in 45 seconds.

SCRAPER TEAMS PRODUCE

"A GOOD COMBINATION FOR THE ROUGHEST WORK"

TAKE boulders, volcanic ash and mud—mix well with decomposed shale—then add mile-high working altitudes, side-hill operation and unfavorable weather...these are some of the problems facing A. Tiechert and Son Inc. as they push a new highway through the Sierra Nevada Mountains in Eastern California. The job, 7.3 miles of freeway construction on State Highway 40, involves moving two million yards of earth in two five-month seasons. In spite of the obstacles, the Sacramento contractor holds the work to schedule, expects to complete the job on time this October.

Four D8 Series H Tractor-491 Scraper teams, push-loaded by D8s of the same series, set the pace for this difficult job. Because of the steep hill haul roads, they start the cuts and fills, then handle earthmoving on hauls up to 700 feet. DW21 wheel units take over on the longer hauls that range up to 7000 feet.

"The 491 Scrapers with D8s front and rear performed very well—especially in wet, rocky ground," says W. W. Staring, Project Manager. And he adds, "Operators and foremen especially like the 491 in rock because of higher apron clearance, excellent ground clearance and the good distance from axle to apron. In most cases we used D8-491 teams instead of shovels on shot breccia. It's a good combination for the roughest work."

On rugged big volume, short haul operations like this, Caterpillar track-type Tractor-Scraper combinations are the most efficient way to move earth. The new D8 Series H, for example, is over two tons heavier than the previous model, packs 23% more horsepower (235 flywheel HP), and with direct drive has a speed of 6.3 MPH forward. Team it with the 491 Scraper

... for more details circle 283 on enclosed return postal card



The finished product—traffic moves with speed and safety over a newly completed section of California State Highway 40.

(34 cu. yd. heaped, 27 cu. yd. struck) or the 463 Scraper (28 cu. yd. heaped, 22 cu. yd. struck) for big capacity loads.

Get all the facts—plus a profit-proving demonstration—on the new Caterpillar D8H Tractor and the 491 Scraper from your Caterpillar Dealer. He's ready right now!

Caterpillar Tractor Co., General Offices, Peoria, Ill., U.S.A.

CATERPILLAR

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BORN OF RESEARCH
PROVED IN THE FIELD

A Look Ahead: Central Mix Equipment For Concrete Roads

By Glenway Maxon
Consulting Engineer,
Milwaukee, Wisconsin

There is nothing about our present concrete plants which cannot be improved. The very fact of their novelty with respect to concrete pavements gives us an opportunity to pick them apart, item by item, and replace with improvements.

The present dual drum paver could be improved only by a third drum. This type of paving art is old, but in respect to central mix concrete, the industry can reappraise as to each item of equipment for mixing, transporting and placing. Every one of these elements has been improved and every one of them has brought forth new thinking with further improvements probable.

Mixing Time: The first and most important improvement was to use large mixers and to cut the necessary time of mixing to the minimum. We see with these large mixers that to mix very dry concrete, even with zero slump, and discharge it is not a problem.

This discovery has led to the construction of equipment capable of transporting, spreading and consolidating such low slump concrete.

It now appears within reason that we can build more durable roads and probably save a bag of cement per cubic yard. Such a road has only been suggested in this country heretofore. Recently I observed a 6 cu. yd. tilting mixer with a redesign of blades and charging mech-

anism. This mixer can actually mix satisfactory concrete in one minute and possibly very dry concrete in a minute and a quarter. Taking the latter figure with a 6.8 cu. yd. batch (which the mixer can readily handle) allowing 15 seconds for discharge and 20 seconds for loading, we get a cycle every 110 seconds or some 32.7 batches an hour. 218 yards of concrete can be mixed per hour, *even very dry concrete*.

At this pace one moderate sized plant can turn out concrete for over 3,000 ft. of 9-in. by 24 ft. pavement in a 10 hour day. This rate of production makes it imperative that our apparatus should be very portable, so that it can be moved from point to point and from job to job with the least possible effort.

Contractors are already mounting the cement hoppers and batching equipment on tractor-trailer wheels. Plants with 3-yd. mixers have been moved 50 miles in an elapsed time of 48 hours from the last batch mixed in the original location to the first batch at the next setup.

New conceptions of the various units for future adaptation to concrete pavement construction deal with all of these items.

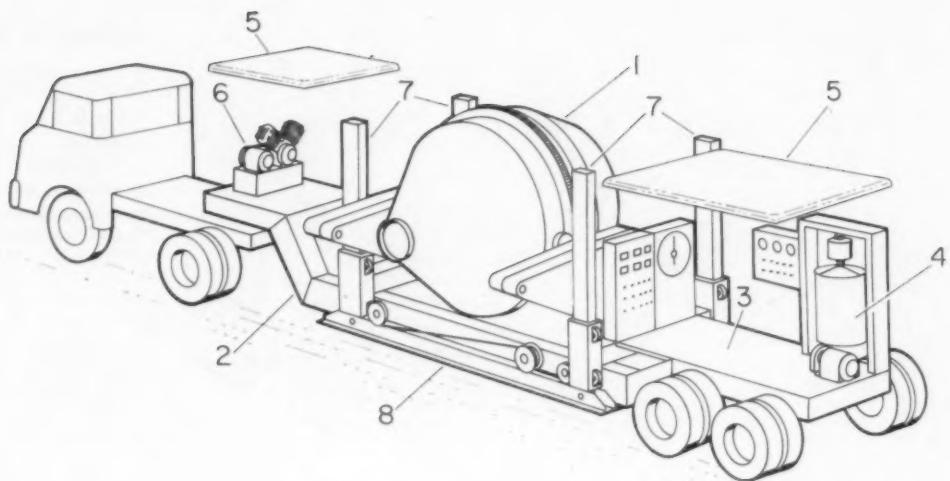
Cement Apparatus: The cement for the big road projects is now unloaded at the rate of 100 bbl. in one-half hour. Where two 6-yd. mixers are used, care must be taken to speed up handling of some 600 bbl. an hour, calling for six cement

trucks. Three or four trucks must be on hand at all times. We propose using an Agitor type hauling unit which can carry 130 bbl. and unload in less than 10 minutes. No more than two of these haulers need to be unloading or waiting at the plant at any time, leaving room badly needed for concrete carrying trucks.

At least an hour's supply of cement should always be up in the air above the cement batcher. All of the cement should be elevated by compressed air and the batcher furnished with a cement slide. These items of supply and measurement proved particularly reliable.

Of particular interest is the method of cement supply. If the compressor for raising the cement causes trouble, the compressor furnishing air for the gates and other plant use can take over for an hour without the need for shutting down operations. Another emergency measure calls for the use of the air compressors on cement trucks. Where two mixers are used, it would be advantageous to have stand-by compressors and cement feeders.

Mixers: Next, we should consider the mixer itself. This is the pacemaker of our plant. It must eventually be mounted on wheels. We have picked the 6-yd. mixer because it seems to be the biggest mixer that can be so equipped and can travel on its own trailer underneath a bridge with 13½ ft. clearance while



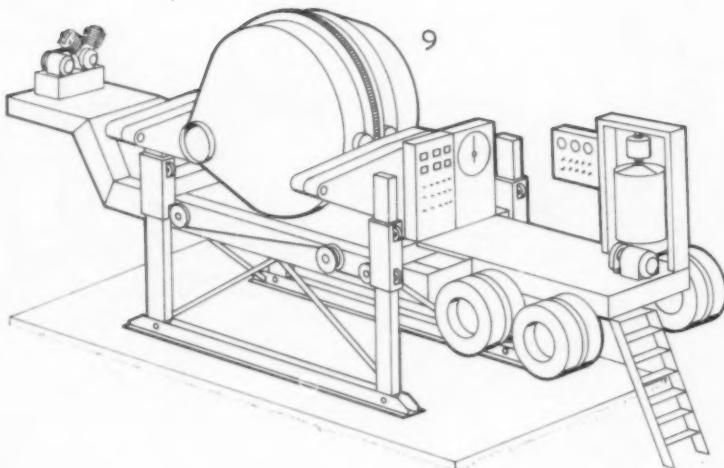
Six-Yard Tilting Mixer And Trailer in Transit

on that trailer. The mixer trailer will probably carry the control station with complete wiring, and possibly the water batcher. And it seems conceivable that a cement batcher could be installed directly above the mixer, this cement batcher being on the trailer floor while in transit.

All of the items here mentioned would be permanently wired in respect to all apparatus on the truck. Likewise water and air would be permanently piped. Upon arriving at the plant location, the mixer and the apparatus would be raised to such an elevation that it could deposit its contents in a concrete conveying truck or agitator. Plug-in electrical connections would bring in the power, and a single gang plug would connect the aggregate batchers and their controls.

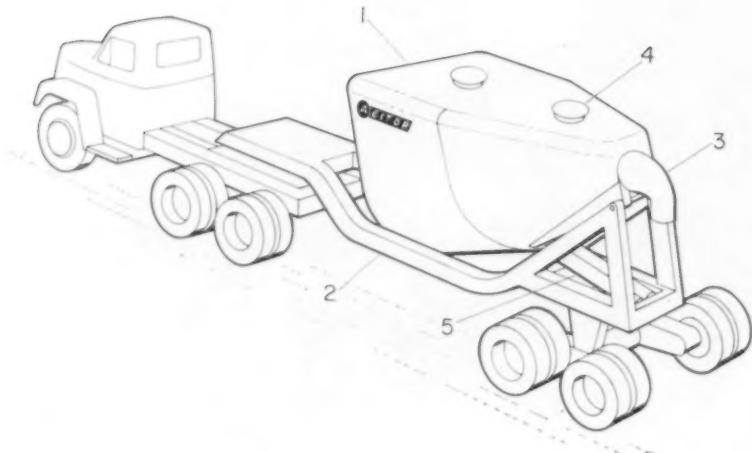
Aggregate Batchers and Bins: The batchers and the bins could, as they are frequently now, be raised on a separate frame with belt or clamshell loading. Or, the bins could be placed on the ground at the site and the aggregates elevated to the mixer by belt conveyor.

I have shown the essential items in a paper written for the Highway Research Board, see Bulletin No. 132, and my proposals are a continuation of one or more of the arrangements with particular attention given to rapidity of mixing and rapidity and ease of transporting the mixing plant.



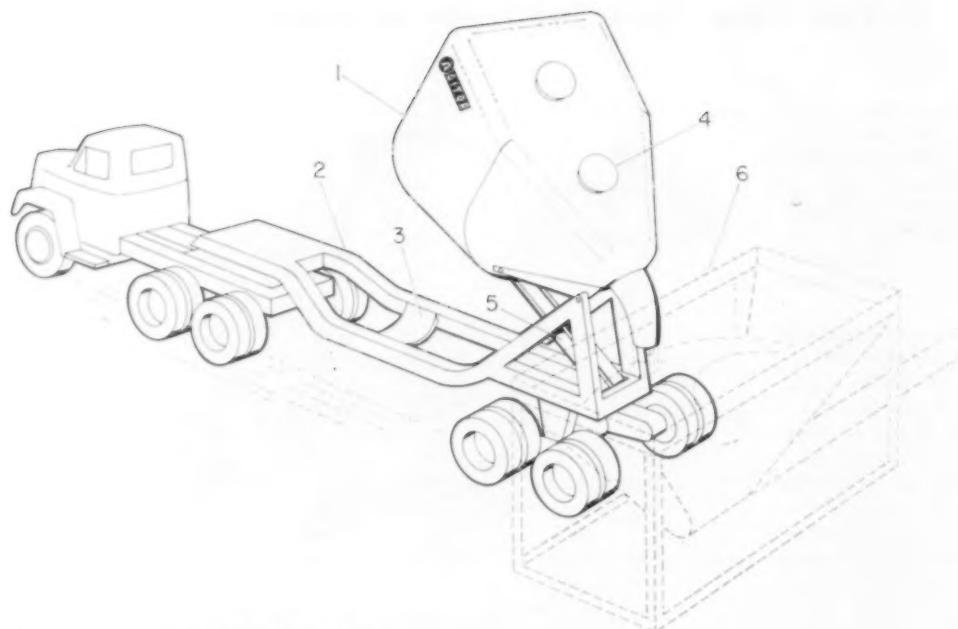
Six-Yard Tilting Mixer in Operating Position

1. Mixing drum which tilts up to discharge into transportation vehicle has a clearance height of 13 ft., with respect to overhead structures.
2. Special drop frame trailer.
3. Operating platform showing control panels and cement and aggregate indicators.
4. Water weighing equipment and injection pump.
5. Indicates roof of housing, housing not shown.
6. Air compressor for handling cement. Also in this respect there is a small air compressor for operating gates, etc.
7. Hydraulically operated spuds.
8. Floats.
9. 6-yard tilting mixer trailer in operating position. Notice that no fixed foundation is necessary. The mixer has been raised to a height such that, upon tilting, it can discharge into a Dumpcrete or Agitor. At a slightly higher elevation, this mixer can discharge directly into a truck mixer.



Agitating Cement Truck

1. 12-yd. concrete body with hood on it for hauling 120 bbl. of cement.
2. Drop frame trailer.
3. Flexible spout with gate for discharge purposes.
4. Loading hatches.
5. Hydraulic cylinders for elevating body to discharge position.



Cement Truck Discharging

6. Indicates large container which can incorporate feeding mechanism to airlift. Discharge from Agitor carrier in 5 to 6 minutes.

Weighing Equipment: In order to simplify the weighing equipment, considerable study will undoubtedly be made on the use of load cells in lieu of torsion tubes, arms, knife edges and other scaling paraphernalia. These elements frequently get out of order when moving and have never had a great degree of sustained accuracy.

It is possible that all of our

batchers can be hung from one point and use just one load cell. Surely there will be no difficulty in treating the water in this manner, and undoubtedly the cement likewise. For paving operations where it is desirable to have a single batcher for all stone and sand, this may become a bit cumbersome. It would be preferable to weigh each ingredient separately, particularly

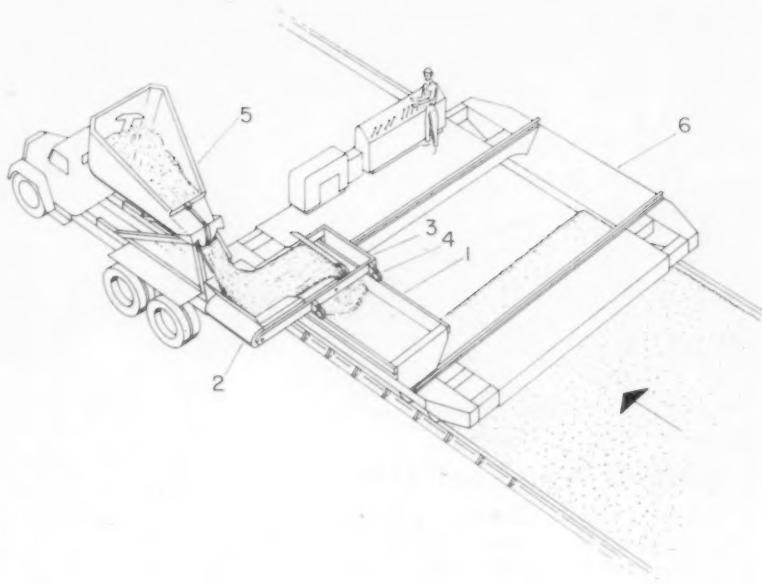
if there wasn't a great deal of additional cost.

In any event, it looks now as though the load cell method may be easier in respect to transportation, more accurate, and do away with much of our difficulty in setting scales and checking them.

Power Supply: Due to the high cost of electrical installation and wiring, it has often been found

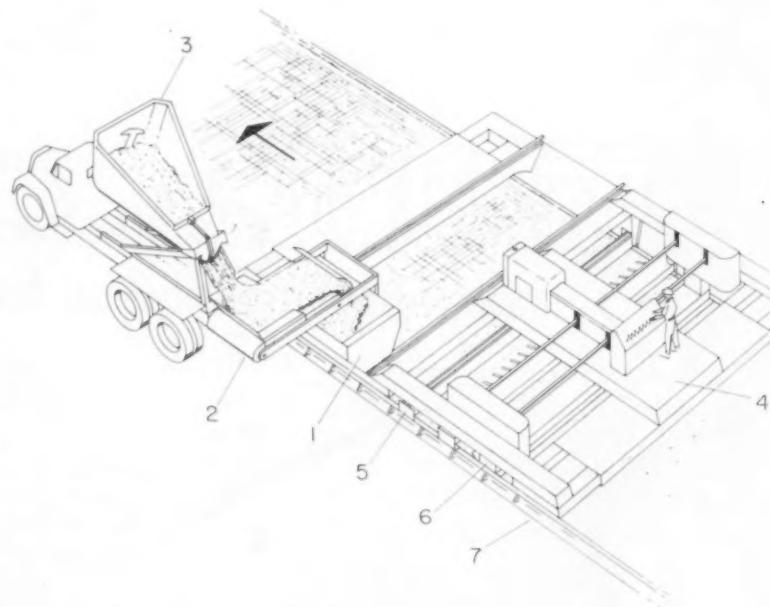
Box Spreader With Belt Conveyor

1. Box spreader with elevated sides to hold full 8 yards of concrete.
2. Belt conveyor about 4 feet wide capable of moving full 8 cubic yards in the course of a minute and ten seconds. This belt conveyor travels the length of the box when the operator of the spreader travels in the direction of the arrow. The frame of the belt conveyor is held against the truck chassis. The truck remains stationary while discharging its load.
3. The frame for the belt conveyor has hook rollers preventing it from tipping due to overhanging load.
4. Rollers on belt conveyor frame.
5. Agitator is shown discharging concrete. The truck is able to proceed past the belt conveyor when the box spreader is moved across the road.
6. The belt conveyor may be inverted to the other side.



Box Spreader on Strike-Off and Finisher

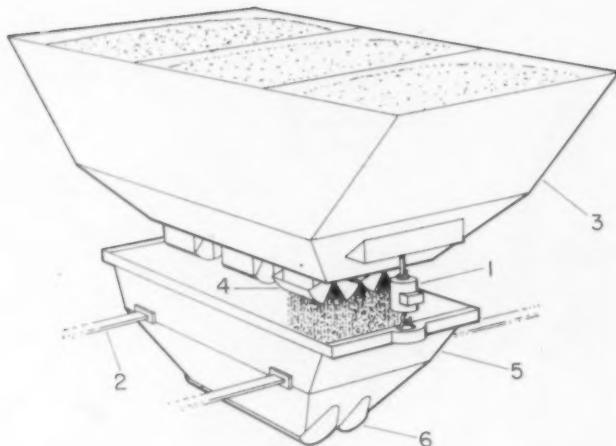
1. Box spreader.
2. Stationary belt conveyor to the box spreader.
3. Agitor delivering 4 cubic yards of concrete to this bucket. The same Agitor may pass on to the first wide box spreader and deliver the balance of its load to that spreader. The next Agitor will deliver all its load to the wide spreader, thereby three-fourths of the concrete goes to the big spreader, the mesh is laid and the balance of one-fourth is deposited in the small box spreader on the strike-off and finishing machine. (Some states require 6-in. bottom course and 3" top.)
4. Operator's stand.
5. The strike-off.
6. Float.
7. Such additional float, vibrator, or strike-off, as may be required in the operations.



economical for contractors to generate their own electrical power. The plants are usually diesel-electric, from 75 to 500 KVA. They should be mounted on wheels, and the carrier might well also contain some of the auxiliary equipment, air compressors and water pumps. One contractor now has installed the complete plant controls in his power-plant vehicle.

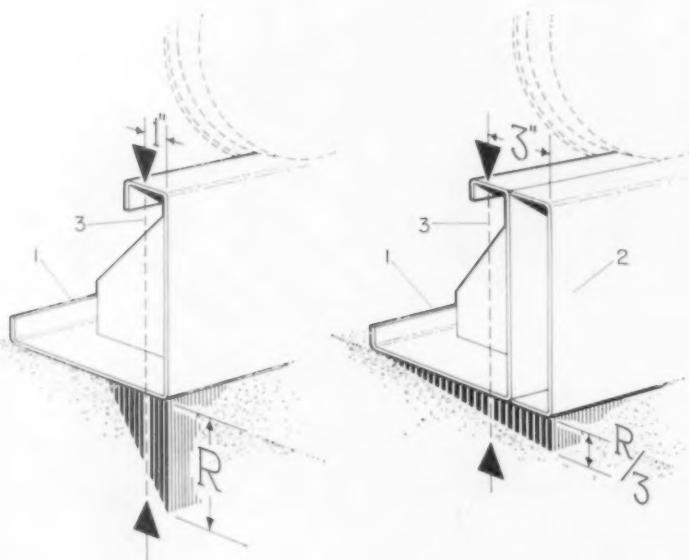
Hauling Units: Relative to the concrete carrying means, I can see the benefit of using a 12 cu. yd. unit particularly with its other utility for transporting cement. This hauling unit can then be loaded with two batches from a 6-yd. mixer and likewise can be unloaded in two steps into a box spreader. At the present time the 8-yd. hauling unit has a capacity of about 36 cu. yd. per

hour in a one-mile haul each way. And where the transportation and roads are such that it can average 25 mph, its capacity is 24.5 cu. yd. at 2 miles; 20.9 at 3 miles; and 17.3 at 4 miles. These are conservative figures. The 12-yd. rigs will take twice as long to load and twice as long to discharge, but the bigger these vehicles become the lower the cost will be for transportation and



Batching With Load Cells

1. This is a combination batcher having two load cells.
2. Struts to prevent undue swaying of the batcher.
3. Bottom of the aggregate bins.
4. Gates.
5. Weigh batcher.
6. Double gates.



Spreading Reaction Beneath Forms

1. Standard form.
2. Welded extension.
3. Shows the center line of forces.
4. Shows the relative intensity of ground pressure. The figure to the left shows that the center of the load comes about 1 in. from the edge. If an extension of 2 in. is added, the center of the load will come $\frac{2}{3}$ in. from the edge, the area of the triangle is the same in both cases but the intensity of the reaction is only one-third as great when the extension is added. This can provide the necessary additional support for the bigger bucket loads.

the drier the concrete that can be easily handled.

Concrete Spreaders: Spreaders form the last fundamental necessity for building better and cheaper concrete roads. The box spreader is very successful, and I propose the following modification which superimposes a short hydraulically-driven belt conveyor on the box itself, designed to receive the concrete at the side of the road from Agitators and load this spreader bucket. This will serve two purposes in that it permits direct and fast discharge of the truck at a considerably higher elevation to the bucket.

Zero slump concrete presently can be mixed, transported and discharged but will not come down a chute even at an angle of 35° to the horizontal. And at 45° , it cannot be brought over the forms as long as the truck is parallel with the forms. Therefore, this short belt conveyor becomes essential. The box can then be increased in size by raising the sides.

Inasmuch as most states require wire mesh located about one-quarter of the depth from the top surface, the work requires the use of two points of deposit of concrete usually from 50 to 75 ft. apart. It would seem proper that a small box spreader is needed for this second point of deposit, as this type of spreader seems to be the only device which can handle very dry concrete.

The conceptions of spreaders using belt conveyors only have been tried or suggested but these have not as yet proven highly acceptable. This does not preclude the eventual perfection of the belt spreader idea.

Paving Forms: Not to be ignored is the use of heavier forms that will carry bigger spreaders, which spreaders can be easily designed if their bigger loads can be supported. The present form throws a concentrated load on the inside tending to tip the forms inwardly. I suggest a revision in form design so that the ground support is well spread directly beneath the centerline of the wheels. There is nothing new about this type of form. It is generally used in European countries. More specifically, we can add the necessary foundations to the forms we already have and move our wheels on all spreaders and finishing ma-

Continued on page 64



In Appleton's new Riverdale subdivision, all the streets are modern concrete

In Appleton, Wisconsin, they paved with **CONCRETE** ...the initial cost isn't just a down payment!

With concrete streets, the city isn't forever paying out tax money for upkeep and repairs.

In Appleton, the Riverdale subdivision developer requested paved streets. City officials approved. Property owners voted in favor of concrete. You hear the same story in cities of all sizes. Concrete's the best street investment.

Concrete is the one pavement that enables engineers to design streets to last 50 years and more. There will be no big upkeep expense to burden property owners and taxpayers after just a few years of service.

Modern concrete starts out strong—keeps getting stronger year by year. No pavement could be stronger even if carved from solid rock! Traffic can't push concrete's solid surface into ruts and ripples. Old Man Winter can't rough it up, either, thanks to special built-in protection from freezing and ice-melting salts.

Concrete's grainy surface provides dependable skid resistance. Its light color means high night visibility. For driving comfort, long-time economy, safety you want, modern concrete gets the vote on all counts.

"Concrete's long life and low maintenance will provide the most economical pavement in the long run."

says CLARENCE MITCHELL, Mayor of Appleton

"Maintenance costs are accepted as a city responsibility and anything to reduce those costs will lower annual city expenditures. Indications are that abutting property owners will pay a moderately reasonable premium for high-type street improvements when the city offers to share the cost."

"Concrete streets are nothing new to Appleton. Some of our streets are very nearly a half-century old and they are still serving traffic. We are confident that our new concrete streets will do as well."

PORLAND CEMENT ASSOCIATION

A national organization to improve and extend the uses of concrete

How Payscraper® "automotive" operating ease *highballs* *your dirt-on-fill* *delivery*

Your operator pulls directly out of 90° turns—with 34-cu. yd. heap loads on either the 2-axle "295" or 3-axle "495." Ample power and traction team with the exclusive International tandem-pump, rack-and-pinion steering to give positive, right-angle turning with full power. This finger-tip controlled system leaves the "steering feel in the steering wheel," even at the top 33.5 mph speed.



You won't need stunt-car "jockeys" or muscle men to give you the dirt-on-fill bonus the 375-hp International Payscraper rigs can deliver! Almost all the danger, hard work, and rump-bumping of rubber-tired rig operation is engineered out of Payscraper models. And an exclusive combination of operating ease, safety, and comfort features is engineered in!

Push-button, finger-tip ease! Your operator simply pushes a button to direct-start the DT-817 Diesel and ready 375 high-torque hp to give a cycle-speeding Payscraper rim-pull of 60,000 lbs.; plus time-saving, "no-lag" control power!

For fast, positive dumping, the high Payscraper apron lift gives you a "barn-door-like" opening up to 94 inches! The positive-acting Payscraper ejector mechanism is powered by the International shock-absorbing, planet-type Cable Control Unit. One cable drum of this simple, fast acting unit actuates apron and ejector; the other drum positions the bowl to control spreading action. Shown, the 3-axle "495" fast-dumping on the fill!





He power-shifts the PayScraper, up or down almost like easing his car into automatic drive. The 4-speed, planetary-type, torque-converter transmission gives him load-speeding *automatic* direct-drive lock-ups in second, third and fourth gears!

Your operator power-steers the 150,000-lb. loaded PayScraper with automotive-like ease. He commands the exclusive "mind-reading" International rack-and-pinion, tandem-pump steering system—plus 3-degree forward spindle pitch that improves scraper balance and prevents "bucking bronco" nose-downs in high-speed turns!

He controls 34 cu. yd. loads on hills, fills, turns—anywhere—with positive-acting PayScraper air brakes. He power-controls all PayScraper dirt-handling actions, finger-tip easy, with the International PTO-driven constant running cable control unit!

And he rides in a foam-cushioned, 15-adjustment, bucket seat that gives positive, selective ride-control to match luxury car comfort.

See for yourself what it means, in highballing your dirt-on-fill delivery, to arm your operators with PayScraper advantages. Prove what happens when you give them the highest power-to-payload punch of the 34-cu. yd. rigs—along with PayScraper operating ease and safety. Choose the 2-axle "295," or 3-axle "495" and let your International Construction Equipment Distributor demonstrate!

Up or down power-shifting—effortless power-steering—fast power control of PayScraper dirt-handling—all help your operator give you fast "kick-outs" and get full pusher hp efficiency. The highest power-to-payload punch of all 34-cu. yd. scrapers helps highball dirt delivery. The planet-powered TD-25 and TD-24 are "pushing" for this fleet of "295's"—building superhighway!

Here's the big torque converter transmission—that helps PayScraper models turn 375 turbocharged hp into industry toppling production! Besides providing smooth shifting and speeds for every need, this torque converter gives automatic lockup for direct, load-speeding mechanical drive in 2nd, 3rd, and 4th gears!



International® Construction Equipment

International Harvester Co.,
180 North Michigan Ave., Chicago 1, Ill.
A COMPLETE POWER PACKAGE

CENTRAL MIX EQUIPMENT

Continued from page 60

chines to adapt them to this type of form.

It is probably up to the contractor to decide whether the cost of handling these forms would be excessive. They are not only heavier but more bulky, but the idea is worth trying out.

Coordination of Equipment: There is nothing revolutionary about the foregoing proposed list of improvements except that they must be carefully designed for intercooperation in respect to function and time. 400 cu. yd. of concrete from two 6-yd. mixers weigh 1,600,000 lb. Every hour this much material would have to be lifted, dropped in the batcher, released to the mixer, dropped in the carrying vehicle, moved to the job, placed in the spreaders and spread and compacted on the subgrade. As the jobs get bigger, the details become more important, and more laborious. But the reward is there for the contractor who can put the various tools together, and who can coordinate team work in equipment and the personnel responsible for the project's success.

Retarders: Highway engineers should recognize the value of retarders, particularly in hot weather and on bridge structures, and contractors might well be in a position to use retarders when it appears advisable. In reference to retarders we have had considerable discussion on their use on bridge slabs. In conjunction with bridge slabs, we should consider using a moderately high slump up to the position of the reinforcing with a top course of low slump concrete and the possible use of special long-wearing aggregate in this course. All the ingredients would be mixed and placed so as to avoid the loss of air content.

Possibly these bridge pavements should not be placed during the heat of the day but done at night-time. With central mixed concrete there should be no question of the control of quality of the concrete in the bridge slabs.

With the use of the box spreader and its comparatively high speed of longitudinal motion, it seems feasible to place the concrete in bridge slabs from one end, this is providing the designing engineer would make

provisions for temporarily attaching the rails to the bridge frame. Using a spreader with a travel speed of 400 ft. per min. and carrying 7 cu. yd. of concrete on each trip, the slab could be more economically placed and with drier concrete than is now the practice. In this way a 400-ft. slab can be placed at the rate of 120 cu. yd. per hour at the far end. Of course this amount of concrete could hardly be consolidated at that rate unless new vibratory methods were incorporated in the finishing train for extending below and around the reinforcing.

Visible Mixing: All concrete mixers can be improved if we can look inside of them and can determine the paths taken by the ingredients being mixed. A walk should be provided so that interested parties can view the mixing action. Slow motion pictures of the mixing action have a distinct place in respect to studies aimed at improving mixing action.

Recording: It is of advantage to the contractor and the state to record cement as it is weighed out and discharged into the mixer. On a continuous strip this recording can show when and how fast the mixer was operating and how much cement was weighed out for each batch. From this information can be garnished the number of batches mixed, the elapsed time and the amount of concrete represented by the recorder.

Rating Mixers: Just like the English system of measurement, our rating of concrete mixers has grown into a senseless pattern of formulas which might well be discarded. In the first place, in figuring capacities we might forget all about cubic yards and square yards of surface and consider cubic feet as being the easiest to translate into lineal feet of pavement and the easiest to translate in pounds per batch.

These big mixers might well start at 50 cu. ft. capacity, go up to 100, 150, 200 and 300. Then we could guarantee that the mixer could hold and mix the quantity of concrete stated on the name plate, at no slump, with the provisions made that as slump increased the contents would be decreased or the orifices would be decreased in size.

Along with this sensible rating of capacity should be the manufacturer's guarantee as to mixing time. This could be under ASTM tests

for mixer performance or tests provided by various states. These changes cannot be made immediately but they would certainly help in the future. For instance, in respect to rating sizes, we might start with the 568 which is supposed to be the equivalent of 2 cu. yd. This size is also supposed to contain 10 percent additional concrete (without any definition whatsoever as to what type of concrete is mixed). Call the baby a 61.

In other words, guarantee the mixer to properly mix 61 cu. ft. of a certain slump concrete. Then we could agree that in a period of two or three years all mixers would come under new standards and when a manufacturer advertises the mixer for 50 cu. ft., it will mix that and not 10 percent more.

In respect to tilting mixers, this can be done readily by changing nothing except the center cylindrical section, making it a bit smaller or a bit larger as circumstances might suggest. Then a 10 cu. yd. concrete mixer which is now designated as 278S will be classified as No. 300.

Units for hauling the concrete can easily be modified to take care of some additions or subtractions of the actual volumetric capacity.

Tire Tread Tester

A new testing device that gives rubber a "fast shave" is helping B. F. Goodrich scientists add to the life expectancy of tire tread rubber.

Diamond-honed tungsten carbide blades, shaving at 60 rpm, scrape the hide of rubber samples to determine their abrasion resistance, the critical factor in road wear of tires. The device, invented by B. F. Goodrich, was described in a paper presented by authors Hershel W. Grinner and D. Scott Sears before the American Chemical Society.

According to Edwin B. Newton, manager of specialty rubber research at BFG's Research Center, Brecksville, Ohio, the new Pico abrasion test evaluates the abrasion resistance of different rubbers, and measures changes in abrasion resistance caused by using different kinds of carbon blacks in the same rubber.



Even on sunny days the clayey dirt didn't always come easy on R. A. Bowen's Interstate 75 job. Here Allis-Chalmers TS-360s are building a cross-over road in the project.

Special Cutting Edges Help Move Gumbo

Public Enemy No. 1 in many parts of Georgia, as far as highway contractors are concerned, is this state's particularly vicious gumbo clay soil. Even when containing some sand, this soil means trouble to the grading outfit because of its tendency to come out in big chunks, and its slowness to dry out to optimum during filling operations.

One contractor who can speak from long experience is R. A. Bowen, head of R. A. Bowen, Inc., of Macon, Georgia. This company which has moved the red stuff for 30 years tackled a 1,400,000 cu. yd., \$800,000 grading contract in

May, 1960. The job was a 10.7-mile segment of Interstate 75 near Cordele in Crisp County. The equipment thrown onto this job consisted of 6 new Allis-Chalmers TS-360 motor scrapers with 3 Allis-Chalmers HD-21 tractors, an HD-16 tractor, an Allis-Chalmers 45 motor grader, and a dozen other assorted tractors, motor graders, rollers, backhoe, etc., in a fleet well balanced for the work at hand.

All went "as well as could be expected" and in fact above par for the gumbo conditions. Over 210,000 cu. yd. was moved during the first month despite wet weather and the usual slow work of getting

into the cuts. The TS-360's were tandem-pushed whenever possible by the HD-21s or other heavy tractors. Loading time in the range of 25 to 45 seconds produced full loads.

Not satisfied even with this progress under the tough conditions, the Bowens switched to Esco cutting teeth in place of the straight cutting blades on the TS-360s. The change was first made on one scraper for a try-out period. When working in the chunky gumbo a typical 40 second loading time was reduced to an average of 30 seconds.

All of the scrapers were then re-



The Esco toothed cutting edge as used on TS-360 scrapers on the R. A. Bowen, Inc., job in Georgia.

fitted, with a definite gain in loading efficiency and therefore a worthwhile reduction in the scraper cycle time. Scraper cycle time ranged to as high as 4½ minutes for a 1,200 ft. one-way haul out of a cut, with much shorter cycles for

the lesser hauls required elsewhere. All in all, the 10 second time gain achieved with the special blades made a relatively important difference from a loading efficiency standpoint alone.

Also the special blades, in serv-

ing to break up the clay during loading, made the work easier on the fills. Unloading was easier and faster, and the material was deposited in a better condition for blading out and drying when necessary.

COURT DECISIONS

Sub's Truck Drivers Must Be Paid for Watering Time

On the trial of charges by the United States Department of Labor of violations of the overtime provisions of the Fair Labor Standards Act, the Federal court in New Mexico granted an injunction against a subcontracting trucker forbidding further violations of this character.

For twenty years this trucking contractor had owned and operated a fleet of trucks with drivers whom he both hired and fired. In the summer of 1958 he was engaged in the hauling of crushed rock in the construction of a segment of Interstate Route 25 between Belen and Bernardo in that state.

Workmen on this project, operating a rock pit and crusher, were employees of the prime contractor, Adams Construction Co. This subcontractor's trucks, loaded at the rock crusher, transported the crushed rock an average of 18 miles to the roadbed site where the rock was dumped and spread.

Under this contract the truck sub-contractor delivered the crushed rock at a fixed price per ton mile. Further, under his contract he was subject to the directives of the Secretary of Labor and obligated to pay his drivers an hourly rate of \$1.99.

On this trial it became clearly apparent that wages were not paid his employees by the trucking contractor for all the hours they were required to be on the job, but only

for such time as the rock crusher was in actual operation. Time was also deducted when the trucks were not operating either because of flats or breakdowns.

On occasions, in two instances for as long as five hours, when the crusher was not operating, his employees were required to stay with their trucks in order to begin hauling rock immediately upon resumption of operations of the rock crusher. As a consequence, in many instances, observed the court, the hourly compensation of these workers was actually less than \$1.00 an hour for the time they worked.

"As a result of this employer's record keeping," said the Federal court in conclusion, "the truck driver's employees did in fact work more than 40 hours in many work weeks during the period between June 1, 1958, and November 1, 1958, without such employees receiving additional compensation at not less than one and one half times their regular hourly rates of pay for all hours work in excess of 40 during such work weeks."

To this the court added in conclusion, "Defendant, Floyd Wigger, is an employer as that term is defined by the Act and as such was responsible for the employment and compensation practices constituting violations of the Act."

Mitchell v. Wigger, 39 Lab. Cas. 69,592 (C.C.H.), U. D. Dist. Court, New Mexico, February 17, 1960

Overloaded Gravel Truck

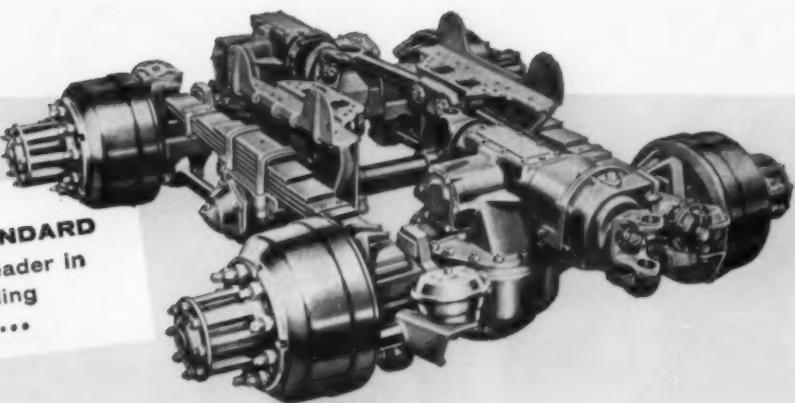
Convicted and fined \$300 for driving in highway construction an overloaded truck in Baker, Oregon, the trucker appealed. This truck had been leased by its owner to an independent contractor engaged in highway construction under a contract with the city.

Charges on which the arrest was made were that the driver was hauling a load of gravel with a gross tandem axle weight of 6,000 pounds more than the maximum weight allowed by the statute.

By the trucker the defense was made that the truck was exempt from this provision of the statute since, by that law the limitations of size and weights "do not apply to any vehicle, article, machine or other equipment while being used by the Federal Government, the State of Oregon, or any county or incorporated city, in the construction, maintaining or repair of public highways and at the immediate location or site of such construction, maintenance or repair."

This conclusion the court refused to adopt. "It would be inconsistent to provide rules for the protection of our highways and to then create an exception broad enough to permit overweight vehicles to seriously damage the same highway," said the Supreme Court of that state. "We cannot equate 'used by' which the statute requires, with the 'used for' a city, which the facts here reveal." (State v. Foster, 352 Pac. 2d 502, Oregon, May 25, 1960)

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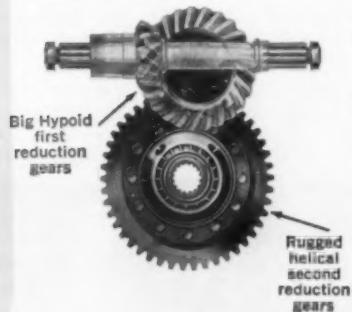
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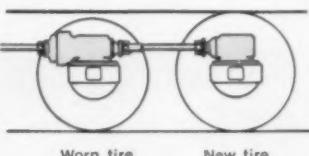
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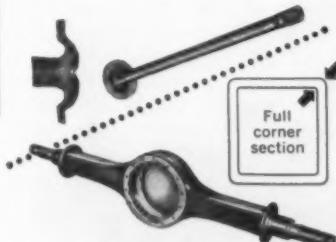
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Lime sacks dropped off at carefully spaced intervals are ripped open with a steel hook emptied and removed.

(Right) : Wrapping up distributed lime with windrowed base material. First step in "quarter-width" repair job. Asphalt mat ripped out, "clinkers" windrowed to the shoulder and old base excavated down far enough to provide for ample depth of new stabilized base.



Experience Report:

Lime Stabilization In Maintenance

Since 1945 hydrated lime has developed into an important road base stabilizer, finding application primarily in clay-type soils. Starting off in maintenance work, lime stabilization has been extended to all types of highway and airfield construction. Accompanying lime's broadening application has been its rapidly growing use in maintenance. Texas highway engineers in particular now consider lime a major maintenance item, with usage amounting to over 8,000 tons annually.

Lime's principal use in maintenance involves patching of flexible pavements, where distress is usually attributed to inadequate base support for the ever-mounting traffic and wheel loads. Generally, at the root of the problem is excessive clay and moisture in the base. Lime helps overcome this problem by first drying out the in-place soil and reducing its plasticity, followed by cementing it into a stable and durable base.

The construction procedure is simple, involving scarification of the existing pavement and base course, adding 2-4 percent lime, thorough mixing and pulverizing, and compacting at optimum moisture content—all taking place in a day's operation. After curing for 3-5 days, the base is resurfaced.

By avoiding excavation and making use of the existing materials, this method provides considerable economy. Stabilization costs average 40¢ per sq. yd. (for 6 in. compacted thickness), with lime ac-

counting for about half of the cost. Further economy comes through reduced maintenance costs. Maintenance engineers report that once a section is stabilized, it will generally require no additional maintenance for many years. Grader operators also attest to the difference; for when passing from an unstabilized to a stabilized section during scarifying, the grader generally comes to a halt, with the operator being jarred from his seat.

Other maintenance uses for lime stabilization besides patching include the rebuilding of worn-out roads (usually secondary), on detour or haul roads, on bridge approaches, along irrigation ditches, to correct "frost boils," etc. In most applications plastic granular materials are upgraded into good base courses; in other jobs heavy clays are transformed into stable subgrades.

Experiences in Texas

To illustrate lime's application to maintenance, let us consider the experiences of District 13 of the Texas Highway Department at Yoakum—the largest user of maintenance lime in the U.S.* This district, led by M.G. Cornelius, District Engineer, comprises nine southeastern counties; in 1959 it used about 5000 tons of hydrated lime for maintenance work, or nearly 70 percent of the total maintenance lime in Texas.

* Other major Districts in Texas are 21 (Pharr), 23 Brownwood), 18 (Dallas), 11 (Lufkin), and 2 (Fort Worth).

This was also 4 percent of the 122,000 tons used in 1959 by the Texas Highway Department for all purposes, including interstate, primary and secondary roads.

According to Earl F. Wyatt, District Maintenance Engineer, the Yoakum District began using maintenance lime in 1957, following a serious 7-year drought. After the rains came in 1957, failures mounted rapidly.

When the maintenance problem first became serious, the conventional patching methods used proved to be too slow, inadequate, and expensive. In many cases the original material pit was depleted or flooded, making it necessary to haul in base materials from more distant locations. Furthermore, in many instances, after the distressed section was opened up, the subgrade was found to be plastic, which necessitated further excavation and replacing with additional material. With lime stabilization, however, the existing subgrade could be stabilized first, then the base, or the subgrade and base materials could be mixed together and stabilized in one thicker layer.

Another disadvantage to the conventional method related to unavoidable delays caused by rain after the distressed section was opened up. Much time was usually lost waiting for the base and subgrade material to dry out. With lime, however, delays were generally avoided or shortened, due to lime's



Sprinkling the wrapped-up lime and base material. It is important to keep moisture at or near the predetermined optimum throughout the processing.

pronounced drying action. First of all, construction could be completed in one day, even in light rain, or if the rain was heavy, construction could frequently be resumed the following day, without damage to the section. Then, once the base was compacted, further rains would not soften it, due to its relative impermeability. Another advantage was that stabilization could be carried out with conventional maintenance equipment, e.g., a grader with scarifier attachment (10 ft. blade is adequate), pneumatic roller, and water wagon. (A Pulvimer is also used on some of the maintenance projects in District 13).

Since 1957 lime maintenance has spread to every county in the District, and it has been applied to the gamut of in-place soils. These include pit-run gravel, caliche, and shell used in base construction, and various clay soils (including organic fills and gumbo clays) used in sub-grade work. In the case of shell, it is necessary to incorporate some of the underlying subsoil into the base to serve as a binder for reacting with the lime. According to Mr. Wyatt, nearly all of the native flexible base materials in his district can be improved with 2-4 percent lime; the precise amount is not too critical. In the early jobs laboratory tests were run to determine the optimum percentage of lime. Since then, enough experience has been built up that lime percentages can



Getting down to mixing, using a pair of graders to speed this patching job (and get done in a single day).

be estimated fairly accurately without testing. Only on large patches and major reconstruction projects does preliminary testing precede construction, and then primarily to determine the specific percentage.

The construction procedure used in the Yoakum District is best illustrated by a "quarter point" patching job undertaken late in 1959 on U.S. 87 between Cuero and Victoria, carried out under Anton Fritsch, Senior Maintenance Foreman, and August J. Polasek, Skilled Laborer and Gang Foreman. Distress occurred along a 1700-ft. curved section, where excess water had accumulated in the base adjacent to the existing concrete curb and gutter. Base failure from the gutter to the quarter point (about 9 ft. width) was indicated by alligator cracking of the 1 in. asphaltic concrete surfacing. The repair job was completed by a 4-man crew in four working days, with about 425 ft. stabilized each day. The original base, consisting of clay-gravel and caliche, was 10 in. thick; the new stabilized base was 11 in., incorporating the entire salvaged base and asphalt mat material.

The construction steps were as follows:

1. Scarify wearing surface, break it up with the pneumatic roller (several passes) and windrow "clinkers" on the gutter and shoulder.
2. Scarify base to 10 in. depth, and windrow top half on inside of cut.
3. Spread bagged lime in single row to give 3 percent distribution (75 lb./cu. yd. of material). A 425-ft. section required about 5 tons of lime, costing about \$75.
4. "Wrap up" lime (i.e., blade part of windrow over lime to prevent dusting), and then mix lime and soil thoroughly with grader. During mixing add water to bring soil to optimum moisture content for compaction. To insure complete mixing, the material was bladed back and forth four times, after which the entire base was again windrowed on the inside of the cut.
5. Blade back "clinkers" and spread evenly on subgrade.
6. Blade back base material and compact with pneumatic roller in 3-4 in. lifts. Tight blade after each lift is completed in order to cut clay balls. During this operation, add water as needed.
7. Shape with grader and "slush" roll.
8. Moist cure for 3-5 days, thereby preventing surface from drying out.
9. Apply new asphalt wearing surface (Dist. 13 uses a different crew for this operation). A common practice is to first apply a temporary seal coat using pre-coated aggregate, followed by a more permanent surfacing later.

During construction, samples were taken, with the results here tabulated.

This construction procedure is
Continued on page 72



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The new No. 12 Series E Motor Grader spreads untreated base and handles cleanup for Massey Sand and Rock Company

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Looking along the reconstructed quarter-strip. Curing moisture application was continued for 3 to 5 days, then the area resurfaced.



Final rolling of the same patch area, which is shown being processed in previous pictures. Work was begun in this patch at 8:00 a.m. and completed by 4 p.m.

LIME STABILIZATION

Continued from page 70

varied somewhat on other jobs, depending on type of job, soil, equipment available, etc. For example, on pavements lacking curb and gutter, the base material is mixed on the shoulder, and the clinkers windrowed on the pavement along the cut. Where a Pulvimer is available, the old asphalt mat and base material are mixed together, the machine serving to pulverize the asphalt to about minus 2 in. size. In subgrade stabilization of heavy clays, the mixing is generally done in two stages, i.e., following preliminary mixing, the soil is allowed to moist cure for 1-2 days, after which the clay pulverizes readily due to lime's "rotting" action. After final mixing the subgrade is compacted using sheepsfoot and pneumatic rollers. In working heavy clays it is customary to use disc harrows and Pulvimeres to insure good pulverization and thorough mixing. Generally the subgrade is rolled after preliminary mixing to shed water in the event of heavy rainfall.

Another construction variation involves bridge approaches, where offsite mixing is used; i.e., the wet soil is excavated with a dragline or tractor loader and mixed with lime along the side of the road, then bladed back and compacted in thin lifts.

The Yoakum District recently

tried the slurry method of applying lime on one maintenance project, but it proved to be too involved for such a small job. Bagged lime was dumped directly into a sprinkling truck, and the mixture was agitated by compressed air provided by a portable compressor. Because it was difficult to obtain a consistent slurry and to spread it through the spray bars, this method was abandoned. Bulk lime has not been tried as yet, most jobs being too small for this method; it would also require additional spreading equipment. Because the bag method has proved so successful for maintenance, District 13 has standardized on it. Each county now has storage facilities for bagged lime, enabling jobs to be scheduled at any time.

As a general rule, the maintenance department does not stabilize patches smaller than 50 ft., because of poor economy and impracticability. If a small base failure develops, it will nearly always enlarge in due time. Working large sections thus saves coming back for further repairs. It is also difficult and expensive to work a small patch with powered equipment, and hand operation is even more expensive and the workmanship generally poorer. For example, labor costs for working a 200 ft. vs. 100 ft. section are practically identical, and the additional lime and asphalt cost for the second 100 ft. is minor.

Another interesting application of maintenance lime in District 13 involved the construction of the S.H. 35 Causeway across Lavaca Bay at Port Lavaca, in which organic muck along the approach road was stabilized to form a working table for construction of a detour lane. On this project one lane of the original concrete highway had to be blocked during construction, and in order to keep the road open to traffic, a new temporary lane had to be constructed. The original road was built on organic fill and stood only a few feet above sea level; brackish water filled the ditch most of the time.

To build a detour lane over this quaky material would have required cross timber foundation construction or backfilling with enormous quantities of shell aggregate. In order to cut costs and speed up construction, the maintenance department decided to attempt to lime-stabilize the muck instead. Because the muck would not support equipment, the work was started by hand along the road shoulder, using bagged lime, rakes, hoes, and hand compactors. Shortly after lime was spread and mixed in, the muck started to dry out and form a stable crust. Gradually the stabilized section was widened, and eventually it became possible to use a small Pulvimer pulled by a light farm tractor. Still later the grader and pneu-



An important step in lime stabilization is frequent visual inspection by an experienced man. Here foreman A. J. Polasec is studying sample of lime-treated base to see if mixing has been sufficiently thorough.



On Texas State Highway 35, at Lavaca Bay, the detour lane on right was built over organic muck which was first lime-stabilized to provide working table for base reconstruction.

matic roller were brought in. In this manner the maintenance crew was able to build a 30 ft. wide by 700 ft. long working table out of the muck, stabilizing it to a 12-in. depth with about 5 percent lime. Four days later a 14-in. shell base course was laid down, followed by two applications of RC-2 asphalt and fine aggregate. At first, doubts were expressed as to whether the detour lane would hold up under heavy truck traffic. The road was reported in excellent shape after six month's. *Resists Freeze-Thaw*

Experience gained in northern Texas (especially Dallas and Fort Worth districts) indicates that lime stabilized sections resist frost damage. According to R. A. Bossy, District Engineer, Fort Worth, a distinct break in frost damage has been observed at the termini of lime stabilized sections. He attributes part of the success of the treated sections to reworking and compaction; however, much credit also goes to the P.I. reduction and hardening effects brought on by the stabilization. The Ft. Worth district utilizes both waste lime and commercial hydrated lime in maintenance work.

Similar experiences with respect to frost damage are reported by Oscar Stewart, maintenance engineer, McKinney, Tex., who is one of the pioneers in the use of lime in maintenance. In his county nearly

Test Sample Data, Patching in Yoakum District

	Liquid Limit	P.I.	Lineal Shrinkage
Existing Base Material	38.6	21.8	12.0
Lime Stabilized Material	34.6	8.6	3.0

all of the stabilization involves high P.I. gravel and crushed stone base courses. In many cases it is necessary to add soil binder to the base material to react with the lime, or to incorporate some of the subgrade soil into the base. Mr. Stewart has reports he never had a failure in his seven years of lime stabilized patching.

In Irrigated Areas

Another user of lime in maintenance is the Pharr district in southern Texas, which encompasses considerable irrigated land in the Rio Grande Valley. According to J. F. Snyder, District Engineer, most of the jobs involve caliche base materials, in which the P.I. runs between 15 and 20; lime requirements for this material are relatively low—1 to 1½ percent. In heavier soils (sub-grade work), up to 4 percent of lime is used.

Although this area is semi-arid, extensive irrigation creates road problems, particularly where ditches are faulty or where leaks develop in irrigation lines. Before new base

and pavement can be applied, the wet, soft spots are lime stabilized to a depth of several feet. The general practice is to excavate all of the wet soil, then bring it back in thin lifts, adding bagged lime with each layer. Mixing and compacting are usually done with the grader and sheepsfoot roller. Lime serves to dry out the soil and also to form a firm foundation for the base and pavement.

In the Houston District, R. A. Scott, District Maintenance Engineer, reports stabilizing over 30 miles of farm-to-market roads since 1954, using 5-7 percent by-product lime. The stabilization involved highly plastic subbase soils, with P.I.'s ranging from 45-60. During the 1959 summer his crew stabilized a sand-shell base with 3 percent of commercial lime. Preliminary lab tests indicated that lime made a Class 1 base material out of the original Class 3 material. His district has also considered slope stabilization with lime, but no jobs have materialized as yet.

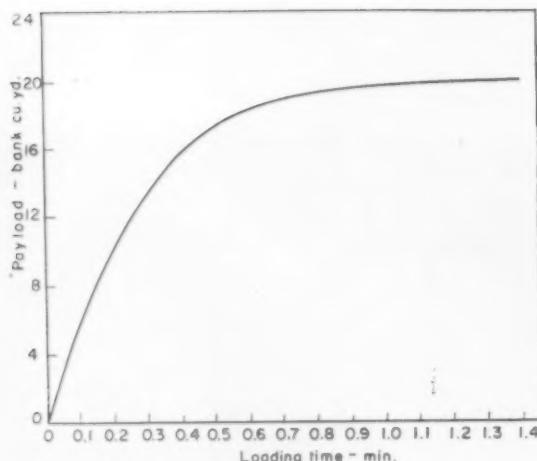


Figure 1. Load growth curve

SCRAPER LOADING TIME

Continued from page 49

$$\text{Returning, } \frac{2,500}{22.6 \times 88} = 1.3 \text{ min.}$$

Accelerating and decelerating = 1.0 min.

Turning, dumping, and boosting = 1.3 min.

Total time = 5.7 min.

Calculations for the economical loading time, which appear in Table 1, show the time to be 0.8 min. All calculations are based on using a 50-minute hour. All volumes are converted to bank cubic yards.

The solid curve in Figure 2 gives the economical loading time for the same equipment and job conditions, with the exception of the haul distances which vary from 500 ft. to 10,000 ft. As might be

expected, the economical loading time increases with an increase in the haul distance, or with an increase in the cycle time. The broken curve in Figure 2 gives the production in bank cubic yards per hour per hauling unit when the most economical loading time is used for a given haul distance.

The results given in Table 1 and Figure 2 apply to the stated equipment and job conditions. These results will not necessarily apply for other conditions. However, the same procedure may be used to determine the most economical loading time for any known equipment and job conditions.

For example, if for the 2,500-ft. haul distance, the road is changed from a 2 percent adverse to a 2 percent favorable grade, the economical loading time will be reduced from 0.8 to 0.7 min. The economical load will be reduced from 19.2 to 18.9 cu. yd. While it is true that a hauling unit can move a larger load down grade than up grade, the additional time required to obtain the larger load may not be justified. An examination of Figure 2 will reveal that the lowest economical loading times are associated with the shortest hauling unit cycle times. Thus, any condition which reduces the cycle time will reduce the economical loading time, and conversely, any condition which increases the cycle time will increase the economical loading time.

Loading time, min.	Other time, min.	Cycle time, min.	Number trips per hr.	Payload, cu. yd.	Production, cu. yd. per hr.
0.5	5.7	6.2	8.07	17.4	140
0.6	5.7	6.3	7.93	18.3	145
0.7	5.7	6.4	7.81	18.9	147
0.8	5.7	6.5	7.70	19.2	148
0.9	5.7	6.6	7.57	19.5	147
1.0	5.7	6.7	7.46	19.6	146
1.1	5.7	6.8	7.35	19.7	145
1.2	5.7	6.9	7.25	19.8	145
1.3	5.7	7.0	7.15	19.9	142
1.4	5.7	7.1	7.05	20.0	141

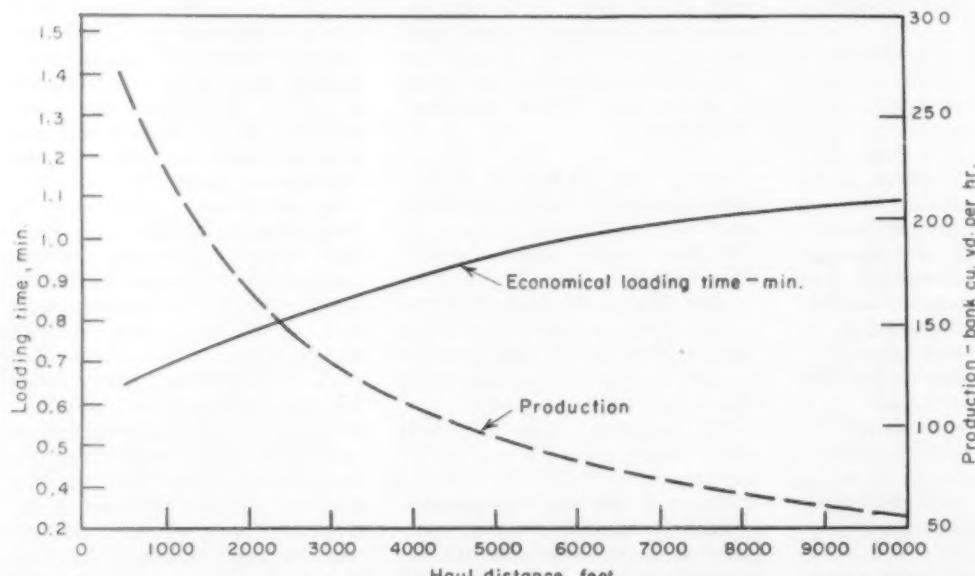


Figure 2. The effect of haul distance on the economical loading Time



How many "machines" is a **MODERN LOADER?**

JOB-PROVE the 4-in-1 and see ...

It's a whole equipment spread of job-getting actions, if it's "the bucket with the bite"—an exclusive clam-action International Drott 4-in-1.

"Dragonized" to dramatize "the bucket with the bite," the five 4-in-1 sizes above demonstrate *plus* actions you get with the exclusive clamshell.

Full-capacity, full-range, depth-controlled bulldozer performance. "Carry-type scraper" action to grade, strip, or spread with inch-close accuracy. Skid-Shovel action to "semi-skid" full buckets of material. Controlled back-dragging clam-action, to grade, pick up, or pull down materials. "Clamming-on" action to grab and load heavy unwieldy "impossibles."

Note also the 4-in-1 gives you the top excavator-loader performance on the market! That includes certified break-out forces ranging from 11,200 lbs. with the T-340, to 43,150 lbs. with the TD-20. And only the 4-in-1 gives you clam-type bottom dumping—that ends sticky materials loading problems, for good!

Here's what the 5 Four-in-One's, shown, are doing: (1) (Left foreground) The 3-cu. yd. TD-20 rig is "dozing"; (2) (Right foreground) The 1 1/2-cu. yd. T-340 outfit as "carry-type scraper"; (3) (Right center) The 1 1/2-cu. yd. TD-6 4-in-1 "semi-skids" load on its skid shoes; (4) (Center) This 2 1/4-cu. yd. TD-15 "biting bucket" clam-handles a stump; (5) (Rear) TD-9 rig is back-dragging gravel!

See for yourself how many "machines" the only modern loader is! Move the 4-in-1 machine-action selector lever. Prove you get a whole spread of money-making actions, that obsolete "single-action" loaders, and double for a yard-full of limited-duty rigs! See your International Drott Distributor for a 4-in-1 demonstration.

International Harvester Company, Chicago 1, Illinois
Drott Manufacturing Corp., Milwaukee 15, Wisconsin



INTERNATIONAL®
DROTT®

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**Exclusive new design of H-30 provides
features and performance which are
unmatched**

by any other 4-wheel-drive machine in the 1-yard class

Ever since 1948 when Hough pioneered the 4-wheel drive tractor-shovel the PAYLOADER has been the pacemaker of the industry. This continued leadership has been the result of constant research and development, better engineering and more experience than any other manufacturer.

Typical of PAYLOADER superiority is this smallest 4-wheel drive machine, which incorporates many advanced and exclusive design features unmatched by any unit of its size and type.

The H-30 is the only unit of this size and type with boom-arms positioned completely ahead of the operator's compartment for the utmost safety.

The H-30 is the only unit of this size and type with a power-shift transmission which does not require stopping for a range-shift. It is of Hough design and manufacture.

The H-30 is the only unit of this size and type with dual brake pedals — giving an "operator's choice" of braking with or without transmission engaged.

The H-30 is the only unit of this size and type with a sealed and pressure-controlled hydraulic reservoir with renewable cartridge-type filter and fine-mesh screen.

The H-30 is the only unit of this size and type which has a separate oil-cooling radiator — a fan-cooled "oil-to-air" heat exchanger that cools the transmission and torque-converter oil.

The H-30 is the only unit of this size and type which has as much built-in accessibility. The dip-stick, filler cap, batteries, connections and other service points can all be reached from ground level.

The H-30 is the first and only 4-wheel drive tractor-shovel that has special seals on all bucket and lower loader points to keep grease in, keep dirt out and reduce wear in these pivot locations.

The H-30 is the only unit of this size and type that has a single hydraulic bucket ram and a high-leverage linkage with a minimum of working parts. The hydraulic lines feature the maximum use of formed tubing and a minimum of hoses. All these refinements help to cut maintenance costs and increase reliability.

The H-30 is the only unit of this size and type available with a complete complement of useful attachments including the exclusive Drott 4-in-1 bucket.

The H-30 has a greater horsepower-to-weight ratio than any other unit of this size and type. This provides more useable horsepower for digging, loading and travel operations.

Four-wheel brakes: The H-30 has four-wheel brakes that are equally effective in either forward or reverse. They are sealed against dust and dirt.

The H-30 has many other big PAYLOADER features including two-phase torque-converter, planetary final drives, power-steer, separate parking brake on drive shaft, rear-axle drive disconnect, 43° bucket tip-back at ground, 8'4" bucket-dumping clearance, full rear-axle oscillation. Bucket sizes range from $\frac{1}{2}$ to 2 cu. yd. (S.A.E. rated).

Your Hough Distributor who sells the complete PAYLOADER line of proven tractor-shovels has one of the finest service and parts facilities in the business, supplemented by Hough factory service personnel.

THE FRANK G. HOUGH CO.
768 Sunnyside Ave., Libertyville, Ill.
Send full data on the Model H-30 PAYLOADER.
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Title _____
Company _____
Street _____
City _____ State _____
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THE FRANK G. HOUGH CO.
LIBERTYVILLE, ILLINOIS
SUBSIDIARY - INTERNATIONAL HARVESTER COMPANY



HOUGH, PAYLOADER, PAYMOVER, PAYLOGGER, PAYLOMATIC and
PAY are registered trademark names of The Frank G. Hough Co.

HOUGH

ROADS AND STREETS, December, 1960



PAYLOADER®



PAYLOADER®

On-the-job performance of the Model H-120 proves it far more productive

**because it has more power, better balance, longer reach
and more dumping height than any tractor-shovel in its class**

Productive capacity and performance are the true measures of any machine, and the 4 1/4-yard Model H-120 excels on both counts. Hough's greater experience and "know how" in tractor-shovel engineering was never more apparent than in the design of this big PAYLOADER.

The Model H-120 has 300 horsepower — more than any other machine in this category. Maximum tractive and hydraulics demands are handled simultaneously without "lugging down." The H-120 has a higher horsepower-to-weight ratio — as much as 30% more than other machines in its size range — because a lot of useless dead weight has been eliminated.

The H-120 has more dumping clearance, and more dumping reach, than comparable units. It loads big trucks and railroad cars more evenly and easier — can stockpile higher.

The H-120 has better balance and stability because of the exclusive use of extra-strong "T-1" steel for box section boom arms that saves over a ton of dead weight on the load-carrying end. The approved and exclusive use of dry ballast material in the rear tires lowers the center of gravity with 50% of the weight below the rear axle.

The H-120 has a separate oil-cooling radiator that is fan-cooled. This exclusive feature provides effective cooling of the transmission-torque converter oil even in hot climates.

The H-120 is even easier to drive than smaller tractor-shovels, say the operators, because of power air-brakes, power-steer, power-shift, and unusual visibility.

The H-120 has a distinctive boom design, forward and clear of the operator for greater safety. It features a single bucket-tilting ram and high-leverage linkage with a tremendous breakout force. Another big advantage is simplicity and fewer parts, reducing wear and maintenance.

The H-120 has a Hough-built full power-shift transmission of advanced design. It is a full reversing, constant-mesh type providing 4 gear ratios in each direction. All four gear changes are made with one lever and *without stopping* for a "range" shift.

The H-120 has "Operators-Choice" brake control — exclusive in its class. Dual pedals permit the operator to brake with or without the transmission engaged, as desired for any operating situation. The large-capacity 4-wheel air brakes contribute greatly to the easy, safe handling of the machine.

The H-120 has special protection throughout to promote long life and reduce maintenance of the engine, drive train and hydraulic systems. A special dry-type, two-step, engine air cleaner gives 99.8% dust-removal efficiency under the most adverse conditions. The hydraulic system is sealed and pressure-controlled to keep out air-borne dirt, and also protected by an exclusive system of cartridge-type filter and fine mesh screens.

The H-120 is provided with canopy-type cab, windshield wipers and special lights as standard equipment. Bucket sizes are available from 3 3/4 to 8 cu. yd. (S.A.E. rated). The exclusive 4 cu. yd. Drott 4-in-1 bucket can also be supplied.



THE FRANK G. HOUGH CO.
LIBERTYVILLE, ILLINOIS
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HOUGH

THE FRANK G. HOUGH CO.
768 Sunnyside Ave., Libertyville, Ill.
Send full data on big Model H-120 PAYLOADER.

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Title _____

Company _____

Street _____

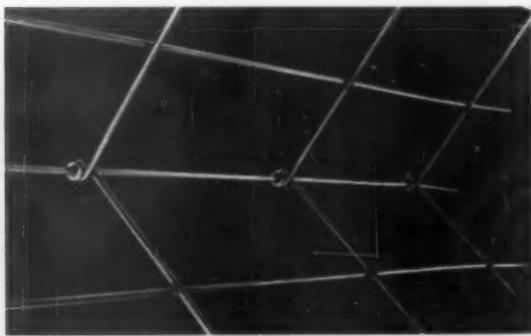
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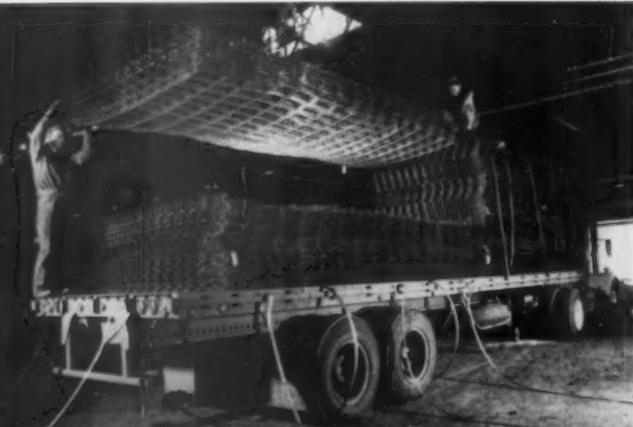
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New Hinged Road Fabric folds in slightly more than half the fabric's full width. This permits easy stacking within the 8-ft. width limit of a truck bed or gondola and simplifies handling.



Close-up of the fabric, hinge developed by Pittsburgh Steel and produced under a patented process. (Below): Ready to go at Pittsburgh Steel's Monessen, Pa. plant—a load of new hinged fabric.



Hinged Fabric for Road Paving is Money Saver

Simplified shipping, faster handling and one-third less installation—these advantages are reported for a new paving product refinement. Called Hinged Road Fabric, it has provided the distributed reinforcement for a 14-mile strip of New York State's \$275 million Northway under construction between Albany and Canada.

The hinged fabric features an off-center hinge running lengthwise on each section. Roadbuilders using this product—one of several being introduced by Pittsburgh Steel—report benefits during shipping, handling and installing. The novel hinge permits folding in slightly more than half the fabric's full width; hence it can be stacked easily within the 8-ft. width limit of a truck bed or gondola. This makes special cradle trucks and cradling equipment unnecessary.

As a result, trucks can be loaded to the limit of their capacity (subject to state weight restrictions) up to twice the weight possible with ordinary fabric.

A single section of the fabric can be handled easily by two men instead of the four usually required for unwieldy separate sheets. And, not being bent during shipping and stacking, the fabric lies flat when installed, without need for worry about restory flatness.

About 800 tons of the fabric was installed recently near Glen Falls, N.Y., on a Northway job being paved by Torrington Construction Co. Patrick J. DiNatale, the Connecticut firm's job superintendent, reported another advantage: one-day service on the fabric shipments from Pittsburgh Steel's plant. Fabric needs could be anticipated closely and trucked in on phone order, the folded fabric size permitting over-road and through-street handling all the way.

Torrington's field engineer, Robert B. Cunningham, reported a savings of about one-third the installation time required with ordinary fabric. Also it didn't poke through the concrete while taking a set; a familiar trouble which requires either cutting the wire or re-paving the spot to cover it.

GALION[®] Pneumatic-Tire Roller

2,000 lbs.—Wheel Load—Water Ballast
 2,900 lbs.—Wheel Load—Wet Sand
 9,200 lbs.—Metal Weight



2239

Only Galion offers EQUA-MATIC front end construction

Through the automatic balancing action of three king pins, safe roller support is always assured when working over uneven or sloping ground. Galion's exclusive EQUA-MATIC design provides an equalizing movement straight up and down of all five steering wheels, and an oscillating up and down movement of the end wheel pairs. Thus, firm compacting contact is maintained with the surface at all times by the five wheels.

plus 18 other important features

- ROLL-O-MATIC or standard gear shift drive.
- SYNCHRO-MESH transmission.
- UNITIZED assembly provides easy access and servicing.
- AUTOMOTIVE-type hydraulic steering.
- LARGEST ballastable capacity in relation to overall size—in excess of 26,000 lbs. total weight with wet sand ballast.
- EIGHTY horsepower gasoline engine.
- HEAVIEST construction—9,200 lbs. metal weight.
- LOW center of gravity.
- 100% COVERAGE—treads of the nine tires overlap.
- WIDE RANGE of speeds—same range forward and reverse.
- SHORT drive shaft.
- DOUBLE drive chains to each pair of drive wheels.
- FOUR-WHEEL hydraulic service brake and independent parking brake.
- EXCELLENT visibility for operator.
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- LARGE doors for ballast removal.
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GREATER STABILITY

Maximum stability and support across the entire front end of the roller is achieved by GALION'S three-point king pin suspension of the five steering wheels. PATENT PENDING.



SYNCHRONIZED 5-WHEEL STEERING

Each of the five steering wheels is adjusted to always steer in its own true arc. This design eliminates the pushing and gouging of material which results when no provision is made to compensate for arcing variations in multiple-wheel steering.



EASY SERVICING

Unitized assembly permits each wheel and wheel brake to be serviced individually, as well as the oil-tight double drive chains. The entire power train can be removed as a unit.

Write for literature.

GALION[®]
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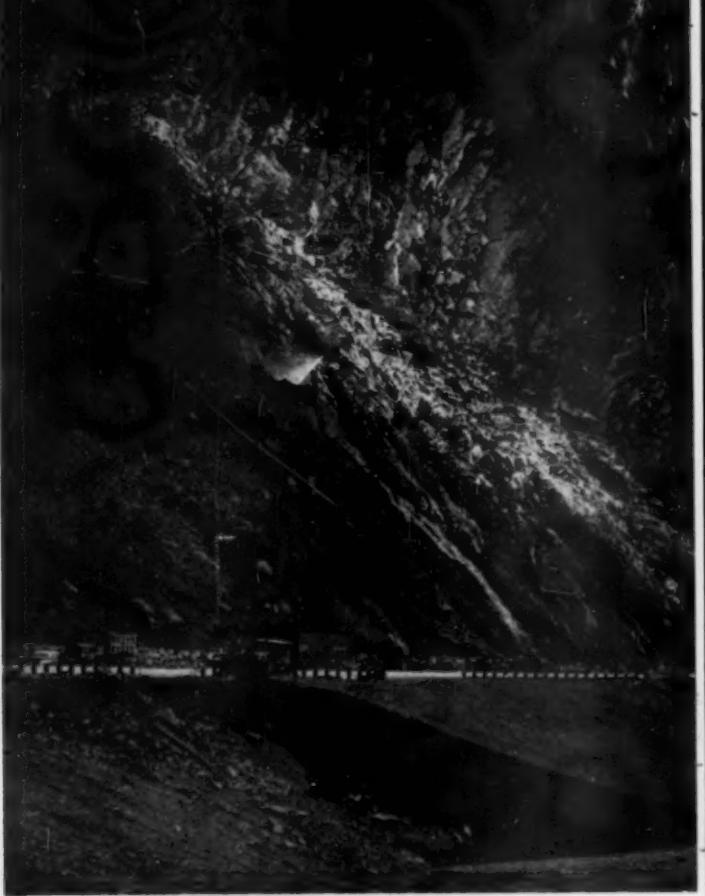


MOTOR GRADERS & ROLLERS

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Water at 280 psi ripped away perched boulders, uprooted trees, left the cliff bare.



Threatening Slide Area Scalped With Water Jet

When a steep rock slope above a highway is mantled with a layer of soil, loose rocks, small trees and brush, the danger is that the whole mass might someday slide onto the road.

This situation is a familiar one in mountainous Eastern U.S.A. A particular danger of this kind existed along US 611 freeway at the scenic Delaware Water Gap, in the northwestern corner of New Jersey. The gap's history has been one of frequent small rock falls and slides. Although no accidents had yet resulted, the condition was marked as a potentially dangerous one by the New Jersey state highway department, to say nothing of the



Shoeing the two principal cliff areas left by the jetting operation. Jet still working at left. Problem of inspectors: how far up to carry the operation.



One nozzle was mounted on the boom of a truck crane, seen working in conjunction with a second jet located up the cliff.



The pair of high-pressure pumps that sparked this unusual job.

costly maintenance involved.

After investigating the geology of the cliff areas, the highway department engineers decided that scalping the mantle away, down to solid rock, would be a good investment in the public interest. The steeply inclined rock here is hard and weather resistant. The problem was simply to scrape it bare as far upward as necessary to leave a condition of stability. In October, 1959, a contract for this work was awarded on low bid of \$120,304 to Peter W. Kero, Inc., of Carlstadt, New Jersey.

The road was closed to traffic, with the cooperation of the Delaware River Joint Toll Bridge Com-

mission, and the Pennsylvania Department of Highways, which were responsible for the necessary detour.

The contractor's method was a simple one. A shovel was brought in to handle coarser rock brought down, but the main strategy was to jet away the mantle using pumps and high-pressure pipe and hose lines. The bulk of the material could thus be washed down the cliff, across the roadway and out into the riverbank, in form of a widened fill slope below the highway.

Two Moretrench Jet-Well pumps were used, one a Model 2 gasoline-powered unit and one a No. 3 diesel. The pumps were located suc-

cessively at positions below the principal cliff area to be jetted. Pipe lines were carried up the cliff, making use of small gullies and shelf spots for access and anchorage. Jetting was done from a succession of nozzle positions. One nozzle at times was directed from the boom tip of a Link-Belt Speeder truck crane. With these 800-gpm pumps, water was shot through the 6-in. lines at 280 psi against the mountainside. Boulders as large as 50 tons were thus loosened and toppled down, where they were drilled and blasted for disposal. All told, some 50,000 cu. yd. of material was washed down in powerful rivulets, leaving the rock "as clean as a hound's tooth."



Testing for water accumulation in a tractor's fuel tank. Drainings are caught in a glass bowl to measure amount of water in the fuel.

Abrasive dirt is the No. 1 enemy of precision parts in your equipment's diesel fuel system, but water doesn't take too much of a back seat in this respect.

Fuel filters perform an excellent job of collecting abrasive solids, but—unfortunately—they are powerless against water.

However, water contains one property that makes it possible to separate it from fuel oil. Being heavier, water always settles to the lowest point in the tank or fuel system. It is this feature, advises the service department of International Harvester Company's Construction Equipment Division, that makes possible the elimination of water before it reaches the equipment fuel tank.

If a large, stationary storage tank is used on the job, it is essential to make certain that the tank is not designed to draw fuel from its bottom.

A space of at least three inches at the bottom should be provided for settling to take place. Full advantage should be taken of this space by allowing fuel to settle for

several hours after filling the tank.

This period allows for the separation of water and other impurities. The bottom of the tank should be drained at regular intervals to keep contamination at a minimum.

If refueling is accomplished from 55-gallon drums stored outside, these should be kept in a horizontal position. This manner of storage prevents rain water or snow from collecting on top of the drums, eliminating the forming of condensation inside the drums.

Keeping water from collecting in stored fuel is only part of the battle, but the next step—keeping it out of the equipment fuel tank—is relatively simple.

The important precaution here is to keep a full tank at night, when most condensation forms. A really full tank does not tolerate room for added moisture. It also is important to drain the tank's bottom at regular intervals.

A further safeguard is the water trap which is a built-in feature of many International fuel systems. This glass bowl device is generally

situated in a low point of the fuel system, allowing the water to settle. An extra-fine mesh screen also separates water from the fuel in motion, the greater surface strength of water causing it to collect on the screen and drop into the trap.

The water trap, as is the case with most safety aids, is effective only if it receives regular service. The petcock on top of the trap should be opened daily. Fuel pressure will force the water out, even if the engine is not running.

Cleanliness comes in handy here, as it is easier to remember to service the trap if the outside of the bowl is clean and the water inside is visible.

If a unit is not equipped with a water trap, then it is doubly important to drain water from the fuel tank—and definitely on a daily basis.

To guard against wasting fuel, the drainings should be caught in a type of glass container which makes it easy to ascertain when all the water has been removed.

Keeping Water Out Of Your Diesel Fuel Line

Concrete Adhesives With THIOKOL Liquid Polymer MAKE LITTLE OF BIG REPAIRS

PROOF POSITIVE



1. Scaled highway surfaces are being lastingly repaired in only a few hours by bonding new concrete to old with adhesives containing THIOKOL polysulfide polymer. The bond is stronger than concrete itself. Field and lab tests prove it.



3. Adhesive with THIOKOL liquid polymer—made and sold commercially by several processors—is spread on prepared surface with brooms or heavy brushes. Thirty minutes later, while adhesive is still tacky, new concrete is poured.



5. Repair completed—road open as soon as concrete is cured. Similar repairs, in service since 1953, show no damage or effects of weather, wear and tear, even on the busiest highways.

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Thiokol Chemical Corp., 780 N. Clinton Ave., Trenton 7, N. J.

Please send me THIOKOL'S helpful booklet "A New Type of Concrete-to-Concrete Bonding." Tells how to reduce remedial time and costs, and to keep roads in service.

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Hours of twist tests and road tests proved the quality and endurance of new IH bogies.



Now!
INTERNATIONAL Six-Wheel Trucks offer
**NEW TANDEM
DESIGNED AND**
give you greater load capacity, more savings

Lightweight, simplified power divider — Through-drive hypoid design transmits equal driving force from triple helical gears to forward axle and then through drive shaft to rear axle. Both drive pinions rotate in a 1-to-1 ratio.

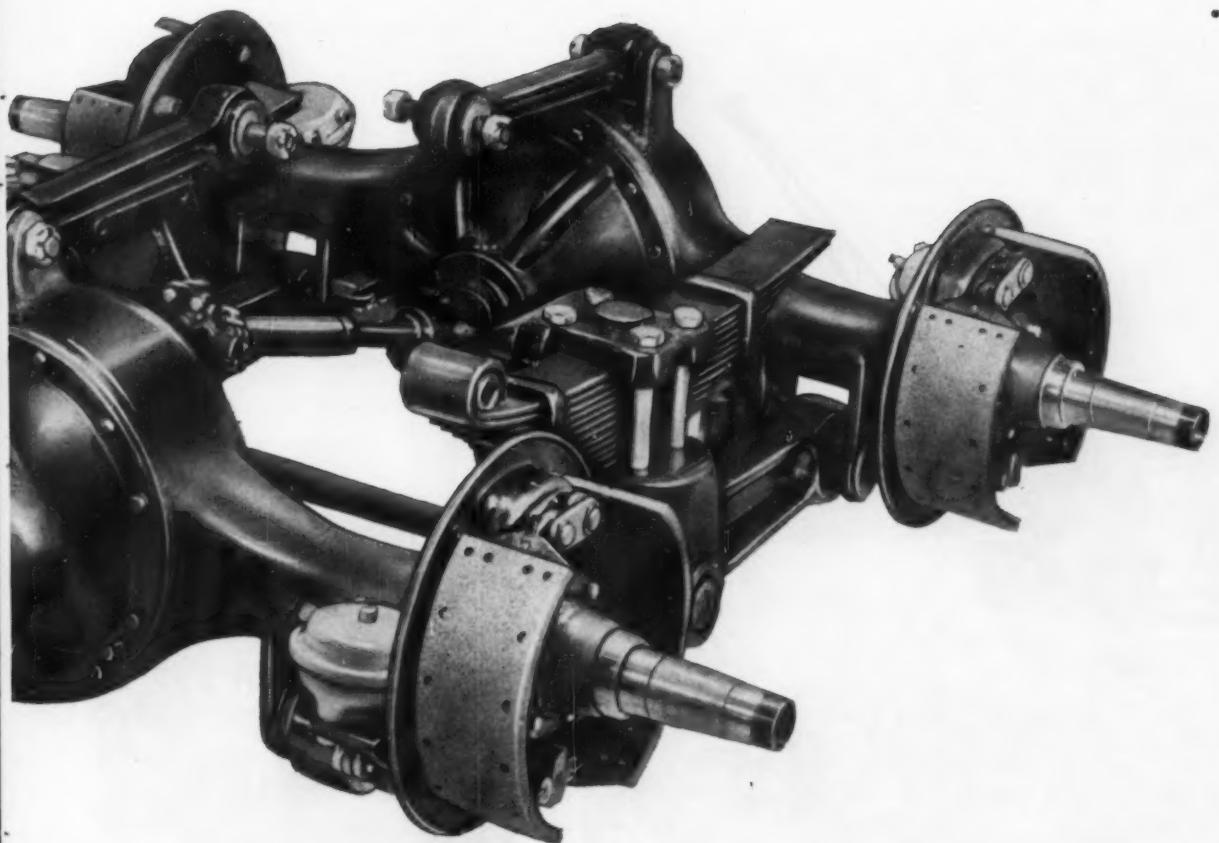
Induction-hardened axle shafts — Induction heating provides a hard, deep outer case and maintains a tough inner core for up to 10 times more resistance to shock loads. Axle shafts will not "fan-out"—they cut the possibility of fragments in the differential or axle housing.

Rugged, lightweight, through-drive design — Handles bigger payloads with less wear and tear. Provides greater strength and increased torque capacity. You work better both on and off highway, at high or low speeds.

Clean-cut appearance — Differential carriers are centered, all drive parts are kept within diameter of housing banjo. Brake diaphragms are in protected areas. Shafts and other parts interchangeable between axles.

Now three IH bogies available — Weight ratings of 30,000, 34,000 and 38,000 lb. capacities. Available in INTERNATIONAL Trucks of conventional, compact, and cab-over-engine designs from 37,000 to 53,000 lbs. GVW, up to 127,000 lbs. GCW, with gasoline, diesel or LPG power.

IH Built, IH Serviced, IH Warranted — Built by the makers of the most complete line of trucks—sales leader in six-wheel trucks for 25 straight years. Service availability nationwide. Performance warranted for 100,000 miles.



AXLES BUILT BY IH.

in weight, backed by a 100,000 mile warranty!



Compact design for a variety of loads.



Mighty "6's" take transit-mix loads anywhere.



Delivers huge dump trailer loads with ease.

INTERNATIONAL® TRUCKS

WORLD'S MOST
COMPLETE LINE

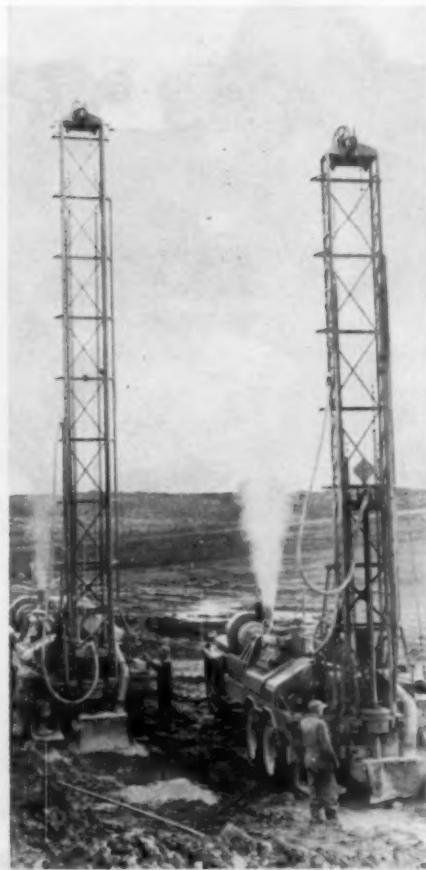


International Harvester Company, Chicago • Motor Trucks • Crawler Tractors • Construction Equipment • McCormick® Farm Equipment and Farmall® Tractors

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ROADS AND STREETS, December, 1960



A rock lift being placed for one of the principal fills. Lorain crane operator "busted" oversize down to 10 in. maximum, in advance of the dozer's final spreading and keying passes.



The pair of Davey M-8-A drill rigs which carried the chief work load for the Pittsburgh runway job. Each unit mounted on a Ford F750 truck included a single-stage 400 cfm compressor, GM Detroit diesel 471 engine and dust collector. Hughes 5½-in. rotary bits typically drilled 37 to 45 ft. holes in medium limestone at a rate of 5 to 5 ft. per minute.

8,000,000 YARD GRADING JOB

Continued from page 48

ing in some places was done with double pushing. Both front and rear mounted hydraulic rippers, usually a single tooth, served importantly in loosening soft sandstone and shale.

Coal figured in this job, some thick veins being mined as the contractor's property (but not a pay item). Several abandoned coal mine pits had to be dug out and backfilled. Material high in coal content was wasted in a manner designed to obviate spontaneous combustion.

Embankment Construction

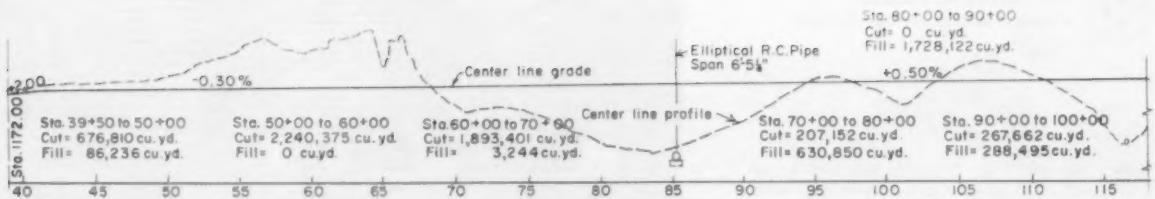
Embankment specifications required benching of existing ground slopes steeper than 5 to 1. Following stripping of unsuitable topsoil, terraces 10 to 14 ft. wide were cut with dozers, each bench sloping inward toward the bank to insure a good key.

Fills were required to be built up in approximately horizontal layers and each layer carried the full width of the fill before beginning another layer. The work-

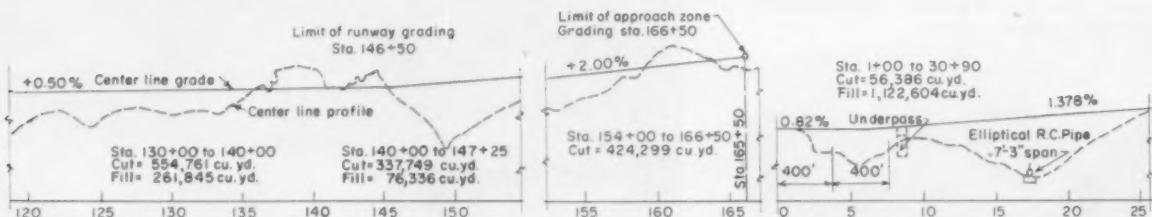
ing width on the larger fills was often quite large, considering that the embankment for runway and parallel taxiway was about 1,000 ft. wide at the top and as deep as 60 to 90 ft. in places. Soil material was placed in 8 in. compacted thickness layers, rock in 18 in. lifts. Earth and rock often were placed in alternate layers, as a means of utilizing the current production, of properly filling rock voids, and also for providing a carpet for the equipment. Rock size was limited to 10 in. Two cranes with drop balls were used to break up the minor amount of oversize.

At other times, various schemes for blending were followed in order to secure a uniform satisfactory fill. One of the inspector's principal concerns from hour to hour was to see that rock voids were filled with finer material. Where rock was a principal material, keying was done by systematic coverage with the spreading dozer. Motor graders helped lay out the finer material.

A noteworthy feature of this project is the method



Profile of cuts and fills along the centerline of the new runway.



Continuation of the cut-fill profile for the runway, plus profile of the approach zone grading at the far end, and of the linking taxiway N-1.

of compaction. While the specifications permitted sheepfoot rollers, practically the entire compaction job throughout has been handled by a pair of Cedarapids vibratory rubber-tired compactors. This rolling was done on all layers, whether rock, earth or mixed material. Towed by crawler tractors the compactors usually were able to secure the specified

density in a single tire coverage, a coverage requiring two passes with lapped tire paths. As a routine more than the minimum coverage was generally given, the experienced operators making circling passages in conjunction with the laying out of arriving material until the tire marks told them that the densification had been accomplished.



Sand would scrape the markings off most tapes!

This is Lufkin's Super HiWay®. Engineers and layout men swear by it. The big reason: it has a Chrome Clad® line that defies defacement . . . by sand, mud, grit or years of use.

Raised markings and protective borders are a part of the tape itself . . . and will last as long. The line is .025" thick with a rust-resistant base coat and a series of electroplatings, topped by a final layer of tough chrome. It's the most durable tape line made.

Available in 100', 200' and 300' lengths, with or without reels. Three choices of end markings plus chainman's conversion rule.

Measure for measure, the finest made...

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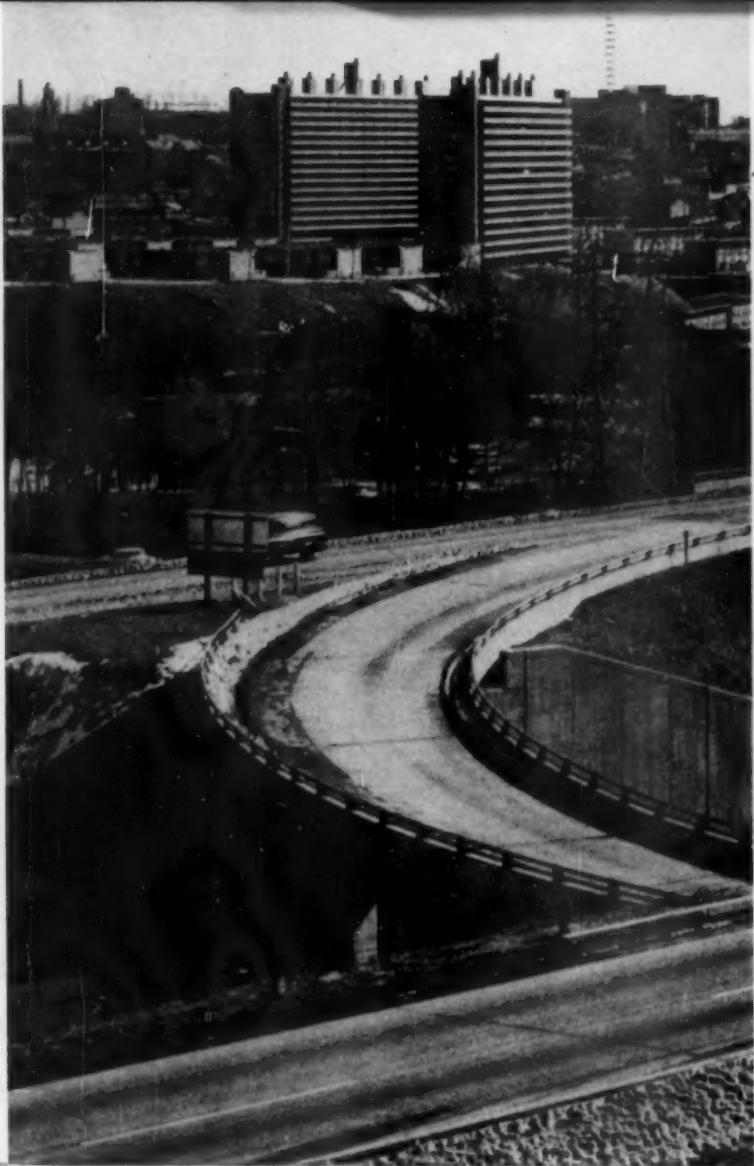


This mark tells you a product
is made of modern, dependable Steel.

Only steel could do this job. City Line Avenue Interchange on Schuylkill Expressway includes seven grade separations on three different levels—an outstanding engineering job costing \$3,000,000 to construct. Michael Baker, Jr., Inc. was responsible in total, for the design of approximately 50 million dollars worth of the Schuylkill Expressway project.



Short-span bridge over Pennsylvania Turnpike at Norristown, Pa., designed in steel for fast erection and low cost.



Mr. Michael Baker, Jr., at far right, discusses the Schuylkill Expressway—City Line Avenue Interchange at Philadelphia that his company designed with USS Structural Carbon Steel. Other men include Joseph Mundo, Wayne H. Meyers, C. V. Knudsen, Robert L. John and C. F. Eben, Jr.

5000 bridges designed at Michael Baker, Jr., Inc. Consulting

Michael Baker, Jr. of Rochester, Pennsylvania, heads one of the country's largest firms of consulting engineers. Since 1944, his organization has designed about 5000 bridges—five for every mile of highway they've worked on—and 98 per cent of them are steel!

In designing bridges, engineers must think of strength, safety and economy, as well as flexibility for the future—and when they think of these things, they think of steel, says Mr. Baker.

The ever-increasing stream of traffic on the highways makes it important to design bridges that can be expanded to handle this increase, yet the investment is so great that the basic structure must be good for 50 years



98% are in Steel

Engineers, Rochester, Pa.

or more. Steel structures fill both requirements well.

If a steel bridge must be demolished, in connection with the reconstruction of a roadway, the steel itself can be salvaged and used in the new structure. On low-cost jobs, this salvage feature is a most important one.

These are just a few of the reasons why steel should be used for short-span bridges. You can confidently design in steel—the material you know best, the material that offers most—knowing it will be available. For more information on the USS Structural Carbon Steels and High Strength Steels designed for bridges, write United States Steel, 525 William Penn Place, Pittsburgh 30, Pa.

USS, MAN-TEN, TRI-TEN and "T-I" are registered trademarks

USS Steel for bridge design

USS Structural Carbon Steel up to 36,000 psi minimum yield point

USS MAN-TEN (A 440) High Strength Steel 50,000 psi minimum yield point

USS TRI-TEN High Strength Steel 50,000 psi minimum yield point

USS "T-I" Constructional Alloy Steel 100,000 psi minimum yield point

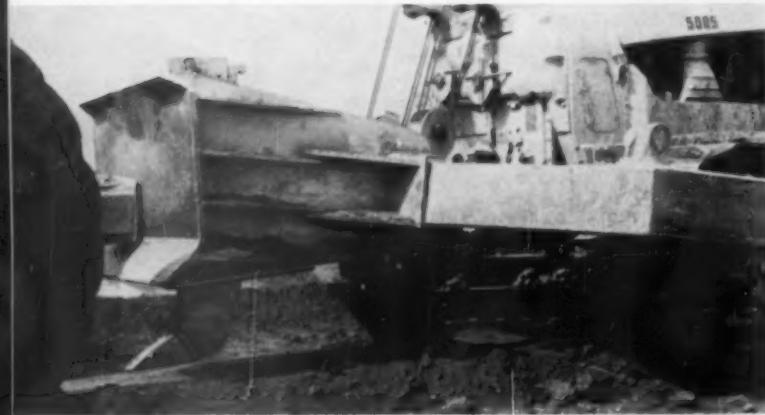


United States Steel Corporation—Pittsburgh
Columbus—Geneva Steel—San Francisco
Tennessee Coal & Iron—Fairfield, Alabama
United States Steel Supply—Steel Service Centers
United States Steel Export Company

United States Steel



Haul road blading was intensively done at all times to cut costs and aid production on this long-haul project. Note mud rolled back on a spring morning, as the grading operators scalp off wet top material from a light snow the night before.



Fancy push block used to load 45-yd. scrapers.



Big production was chalked up by MRS model 200 and 250 tractor-scraper units. Twin-engine Euclid TC12 dozer was good match in pusher capacity.

8,000,000 YARD JOB

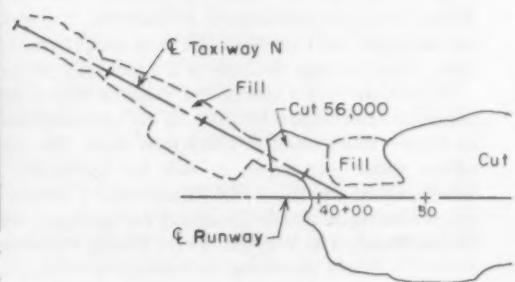
Continued from page 89

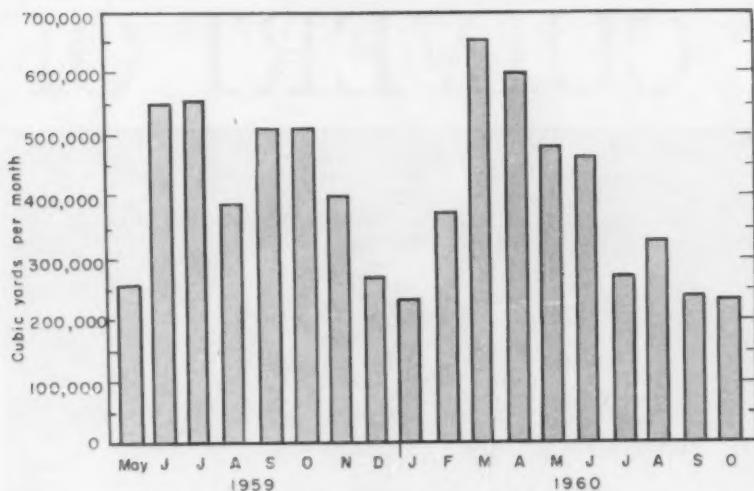
Daily compaction tests were taken in a program which included samples from each lift. Harrison Construction Company also made density and moisture checks for its own job control purposes, using nuclear equipment purchased from Nuclear Chicago Corporation.

Specifications for embankments required 90 percent compaction as determined by Federal Aviation Agency (CAA) Test T-611. Densities of 94 or 95 were regularly attained.

The top 9 in. embankment lift and a 9 in. layer in cut areas were specified to consist of 4 in. maximum material, compacted to 95 percent.

The compaction as well as the blending, and the all-important matter of moisture control, were





How Harrison Construction Company kept up a remarkable even flow of pay yardage, despite seasonal weather that in former years would have shut down such a job in the Pittsburgh area. The 1959 yardage was all on Section 1. Big output in the 1960 spring made possible by opening up of entire job. August bulge includes heavy grading for a road relocation. Only 600,000 cu. yd. remained after October for cleaning up.

handled under a close working relationship between the contractor and the engineers. Harrison Construction's leaders have taken a special pride in doing a good job on this airport for their home city.

Compaction also has been aided by equipment routing. As usual, some trouble was experienced in getting operators to stay out of the ruts of the fellow ahead and disperse their haul paths, but this routing contributed systematically to the compaction job. A loaded MRS scraper incidentally was used at times specifically as an auxiliary compaction rig, to help keep up with production.

Winter Operations

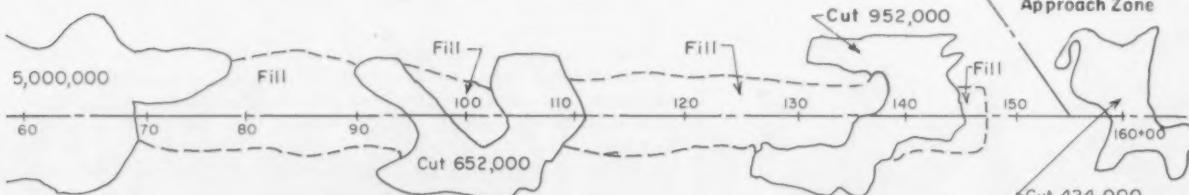
The 1959-60 winter's work de-

serves a few words of comment. Most of the winter production was centered in two Marion 111-M shovels, working in the biggest cut. This cut included extensive shale as well as limestone. The winter proved to be one of the coldest in many years, but shovels on single shift worked on all but a few days, with production dipping only to 230,000 cu. yd. during January, 1960, the worst month.

During the early spring, scrapers began again where the material was workable and not too wet, but the equipment often had to be pulled to new locations or stopped because of moisture conditions. The criterion as to whether to work often was "can we get traction today with

Continued on page 98

Grading plan for the new East-West Parallel Runway at Pittsburgh Greater Airport. Relatively simple cut-fill pattern, but on a three-mile-long axis.



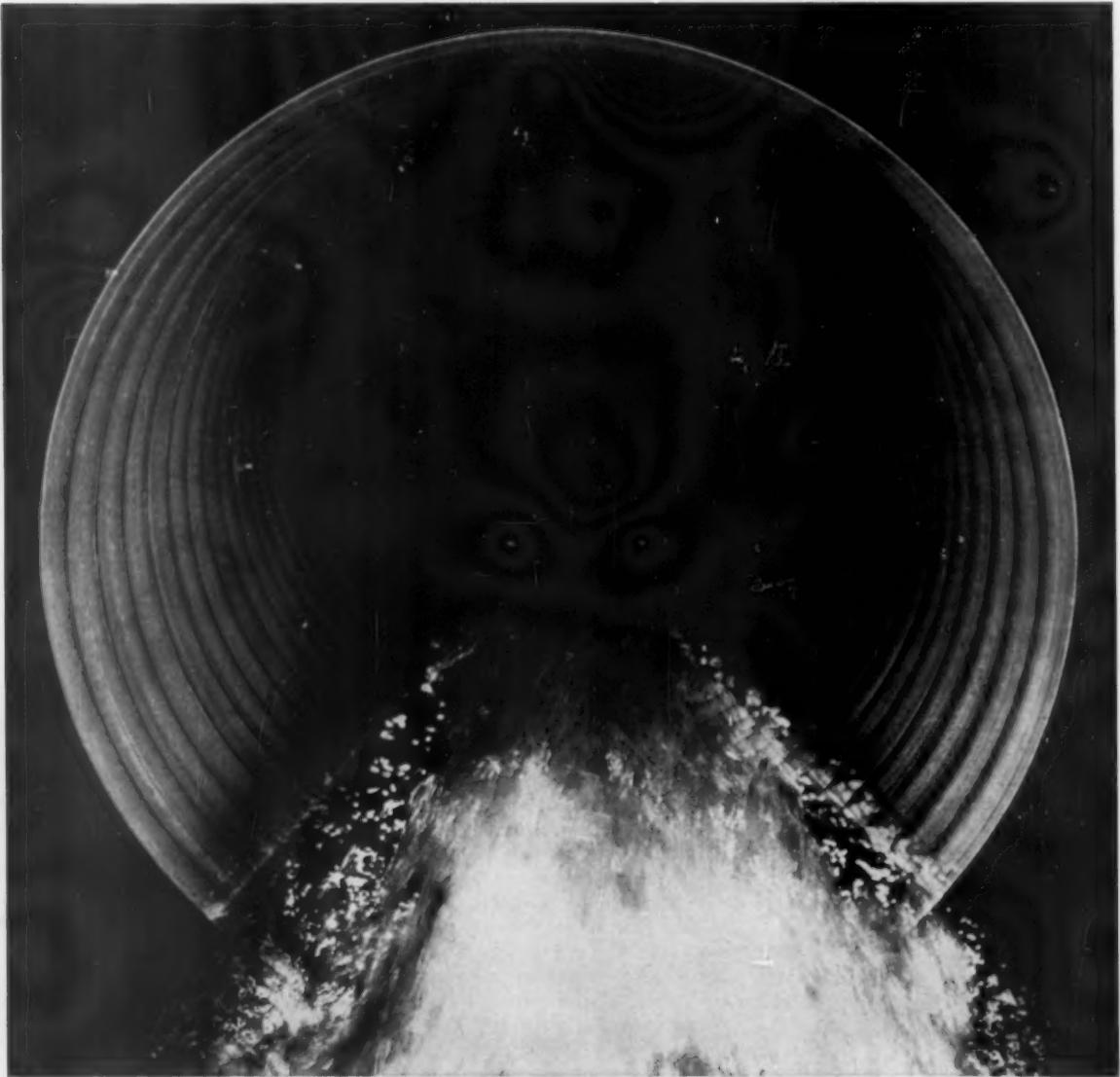
Light plant along Harrison's main haul road—roofed to shield lights from plane pilots coming into the Pittsburgh airport.



Ripping figured importantly in the scraper work at Pittsburgh airport. Here an Allis-Chalmers HD-21 tractor is ripping with a single tooth, in soft rock and shale pockets bypassed by the belt loader.

NOW AVAILABLE
NATIONALLY

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Strong protection against pipe failure

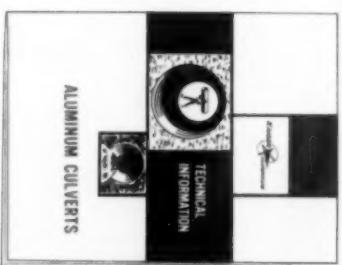
Last year the first *all-aluminum corrugated culvert pipe* came into use in modern roads and highways.

The reason: the success of new Kaiser Aluminum Culvert Sheet—a special high-strength clad alloy based on ten years of severest soil corrosion testing.

The corrosion resistance of this new aluminum pipe is as thick as the metal itself. It is not endangered by everyday scrapes and runoff abrasion—conditions that chip off a galvanized coating and expose bare steel to rusting out. For any culvert load, fill limit, or safety factor you have normally specified for steel, there is now an aluminum pipe strength to meet your requirements. Independent tests show comparable installed pipe performance.

Here are some of the subjects covered in the bulletin
"ALUMINUM CULVERTS - TECHNICAL INFORMATION"

- where to use aluminum culverts
- soil considerations
- how to determine sizes
- installation and assembly
- availability data
- suggested specifications



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KAISER ALUMINUM



Saves up to 20% in total job cost

Since early 1960, contractors have reported savings up to 20% in total job cost because of the lower handling and installation costs of aluminum culvert.

Aluminum pipe weighs less than one-third as much as steel—160 pounds against 500 pounds in a typical 20' x 24" section.

This means that winch equipment is seldom needed for lifting. Aluminum pipe is loaded and positioned by hand, sawed to size almost like wood, and easily connected. A typical crew can install about 20% more of this new culvert per day.

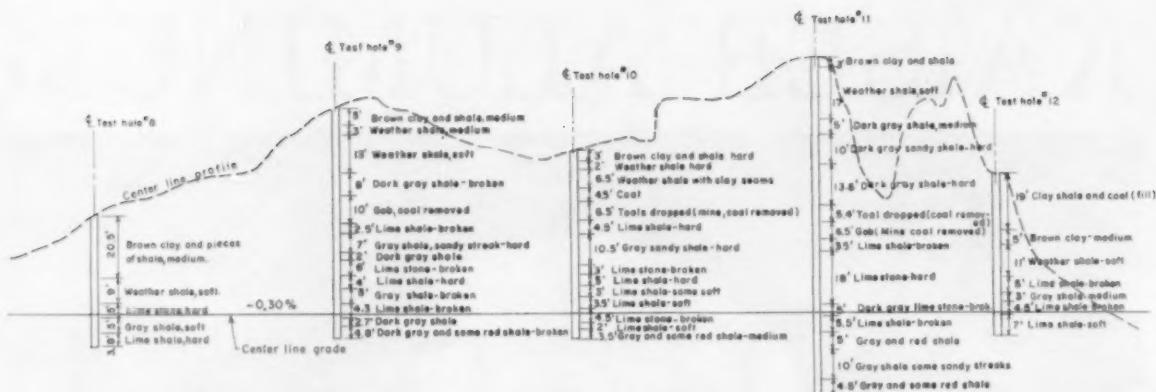
For availability and complete technical information mail the reply card above...or contact your nearest Kaiser Aluminum Sales Office listed in your telephone directory.

ROADS AND STREETS, December, 1960



New leadership in the world of aluminum

. . . for more details circle 296 on enclosed return postal card



The largest cut of nearly a million cubic yard—how it was bored for advance soils and rock data as an aid in estimating and designing the project. The contractor made supplementary boring at such locations prior to bidding.

8,000,000 YARD JOB

Continued from page 93

our rubber-tired equipment?" Overly wet clay sometimes was spread out to dry before rolling. At other times, in the cuts, top layers of wet material were bladed back to uncover dryer soil. By using "all the tricks," some progress was made throughout the spring.

During the 1959-60 winter the big cut was taken down to about 4 ft. above template grade, and the floor maintained at this level for construction hauling. The final lift was drilled and shot later as the job began to level out.

Rock Drilling and Blasting

Over 2,500,000 cu. yd. of the job required drilling and blasting. Here again the pace was a steady one. Key machines were two Davey truck-mounted rotary drills, 5-5/8-in. bit size, suitable for the shale and relatively soft strata of sandstone and limestone. These machines typically drilled 37 to 45 ft. holes on 13 x 13 patterns. Track-mounted percussion drills with 3 1/2-in. bits handled the shallower lifts and hardest stone.

Blasting was tried with "a little of everything" because of the constantly varying conditions encountered. The chief blasting agent however consisted of Atlas ammonium nitrate prills (33 1/2 percent nitrogen) used with Atlas Giant 75 percent gelatin primer and millisecond delay caps.

Acknowledgements

This project is being built for the Board of County Commissioners of Allegheny County, consisting of Dr. William D. McClellan (ch.), John E. McGrady and John M. Walker; with design and supervision under the Allegheny County Department of Aviation, John B. Sweeney director of aviation, Joseph W. Carlson chief engineer, Socrates Lardus design engineer and George A. Douglas chief construction engineer. The Federal Aviation Agency on this federal-aid project is represented by Bernard F. Tague, district engineer at Harrisburg.



Big tires on the MRS scrapers—Good-year 37.5 in rear and 33.5 in front—helped measurably in the production.

Harrison's Grading Equipment at Pittsburgh Airport

Shovels: 2 Marion 111-Ms, with 4 1/2-yd. Esco buckets.

Draglines: 1 Manitowoc Speed-crane, 3 1/2-yd. (in early weeks only).

Rear-Dumps: 7 Euclid, 15-yd.; 4 LeTourneau-Westinghouse B Tournarockers.

Bottom-Dumps: 13 Euclids, 12-yd.

Belt Loader: 2 Euclids, 36-in. belt

Scrapers: 3 MRS Model 250s, 40-yd.; 7 MRS Model 200s, 35-yd.; 4 Euclid TS 24 twin-engine, 30-yd.

Tractors: 4 Euclid TC12s; 5 Caterpillar D9s and 6 D8s; 1 Allis-Chalmers HD-21 with ripper.

Drills: 2 Davey M-8A rotary, truck-mounted, 6 1/2-in., complete with compressors; 2 Ingersoll-Rand Trac I-Rs, 3 1/2-in.

Compressors: 2 Ingersoll-Rand Gyro-Flo 600s.

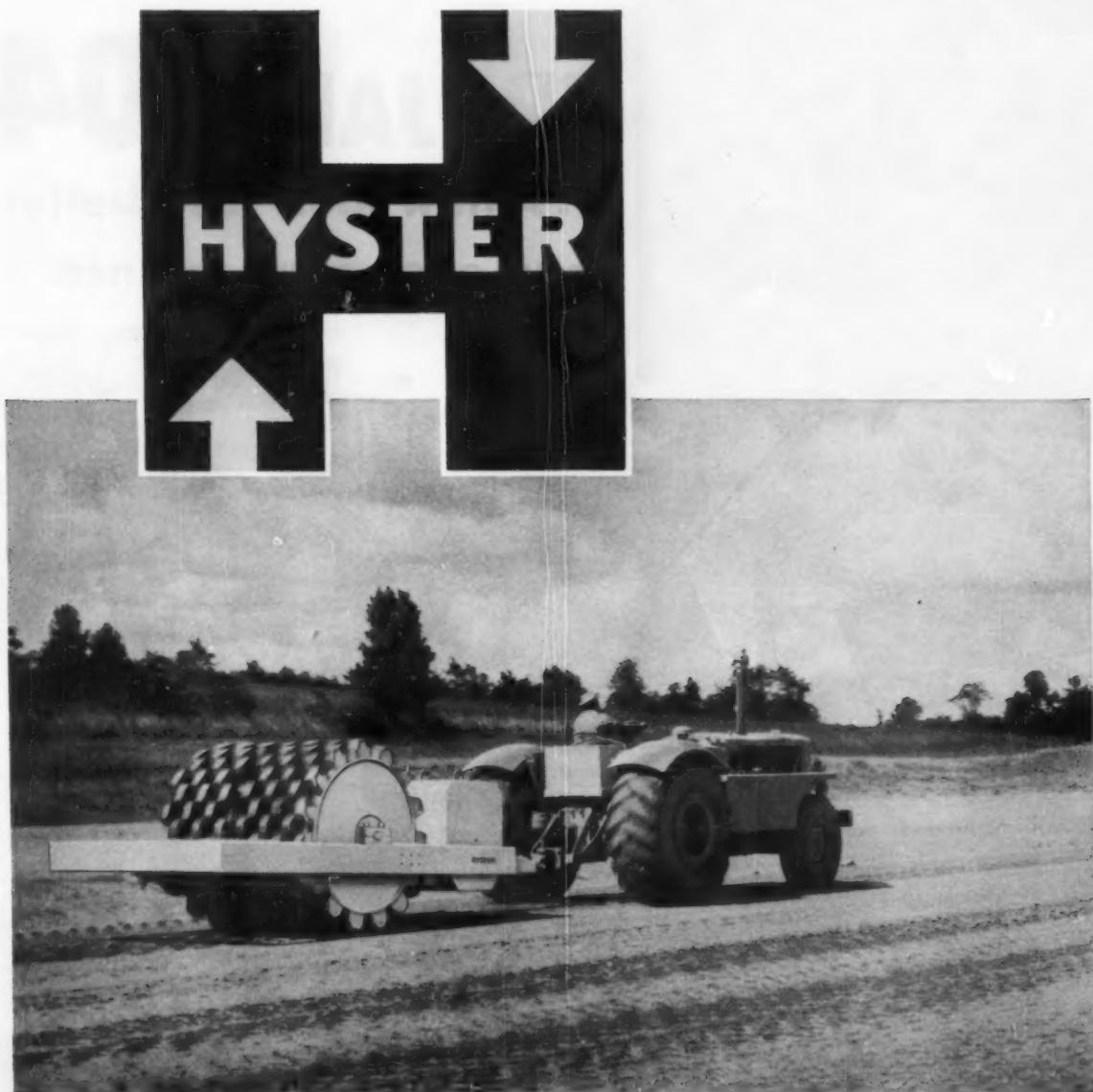
Miscellaneous: 1 Gradall; two large sprinkler rigs (converted Cat DW20 and Euclid b.d.); service and repair trucks, etc.

Rollers: 2 Cedarapids rubber-tired vibratory compactors.

Motor Graders: 4 Caterpillar 12s.

Cranes: Lorain Moto Crane, for drop-ball work and other use.

Light Plants: 4 units, 5 kw to 10 kw.



Compaction for 3¢ per cubic yard

HYSTER® has it!

Contractors report:

- New Hyster Model D Tamping rollers get compaction at speeds to 15 MPH.
- High speed rolling cuts compaction costs to less than three cents per cubic yard.
- Large contact area of tamping feet—21 sq. in.—gives fast “walk out”!

Ask your Caterpillar-Hyster dealer for a demonstration soon.

Cat and Caterpillar are registered trademarks of Caterpillar Tractor Co.

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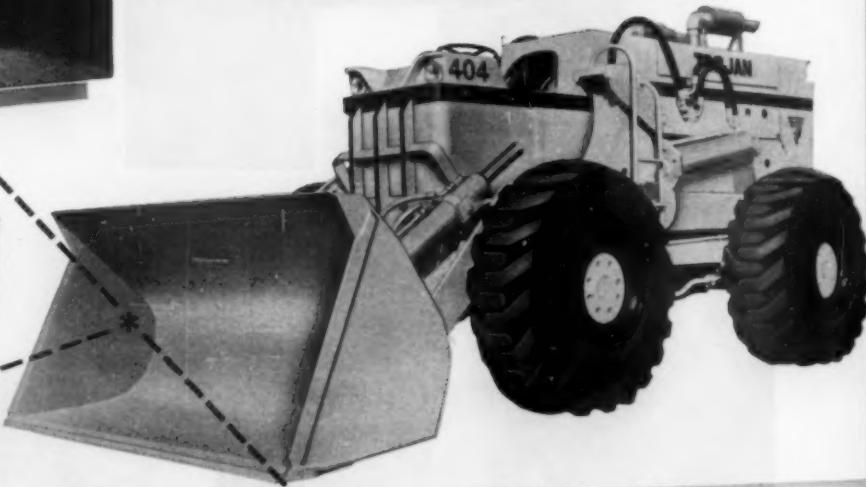


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... A new look with better
than ever performance



Better than ever performance features and refinements now make the Trojan 404 the unequalled tractor shovel in its own power and weight class . . . Today's '404' is available with a 336 h.p. G.M. diesel engine. Wheelbase has been increased for greater stability. A newly designed filtered hydraulic system, new main boom hydraulic lift cylinders with longer lived packing, and armored three wire hydraulic hoses, greatly reduce maintenance problems. Wider tire selection too. The man to see is your Trojan distributor. Ask him to prove the *better than ever* Trojan 404 on your job.

TROJAN MODEL 404 24,000 LB. LIFTING CAPACITY

All the time-proven features so valuable in the production ability of Trojan, have been maintained in the new Model 404. These added refinements now provide even better performance.

TROJAN®
TRACTOR SHOVELS
YALE & TOWNE

THE YALE & TOWNE MANUFACTURING COMPANY
TROJAN DIVISION • BATAVIA, NEW YORK

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TRAVELING RIGS

Continued from page 53

tied by 2 x 8 diagonals for stiffness.

At the bottom, hanging over the ground, the downstanding members were tied together by 4 x 6 beams as a base for light ladders placed between the two ends, forming a light weight, 8-ft.-wide work platform.

The whole assembly worked in the manner of a giant sticking his arm out at right angles just clear of the deck overhang, then cupping his fingers below.

Cantilevers. Formwork for the cantilevered slabs also were fabricated in plywood sections, but it was braced in an unusual manner. The bracing consisted of a 7 ft. long, 4 x 6 in. beam nested against the underside of the top flange of the outermost bridge girder (held there initially by form ties). This beam was then braced at a diagonal by a 4 x 4 post, set against the bottom flange of the girder, and meeting the top beam at a point about 3 ft. from the girder, to form a right-angle triangle. Plywood plates, nailed both to the post and the beam, provided secure connections.

Then a 1 x 8 board was nailed at right angles to the diagonal post, tying back to the upper beam as it met the bridge girder. Double 2 x 4 waler along the outer edges of the beams served to stiffen the whole assembly.

These assemblies are made up in a field carpenter shop, to standard size, for quick placement as formwork proceeds.

Once in place, the assemblies formed the base for built-up plywood forms (including a temporary outside railing), ready for placement of reinforcing bars, some of the electrical conduits in the sidewalk, and concrete.

Credits. The Woodrow Wilson Bridge is being built by the U. S. Bureau of Public Roads as the federal contribution to the Circumferential Highway. Connections on the Maryland and Virginia shores are under the respective states. H. B. Herring is resident engineer for BPR. The complete \$15 Million structure is expected to be ready for traffic by midsummer of 1961. Pitts-



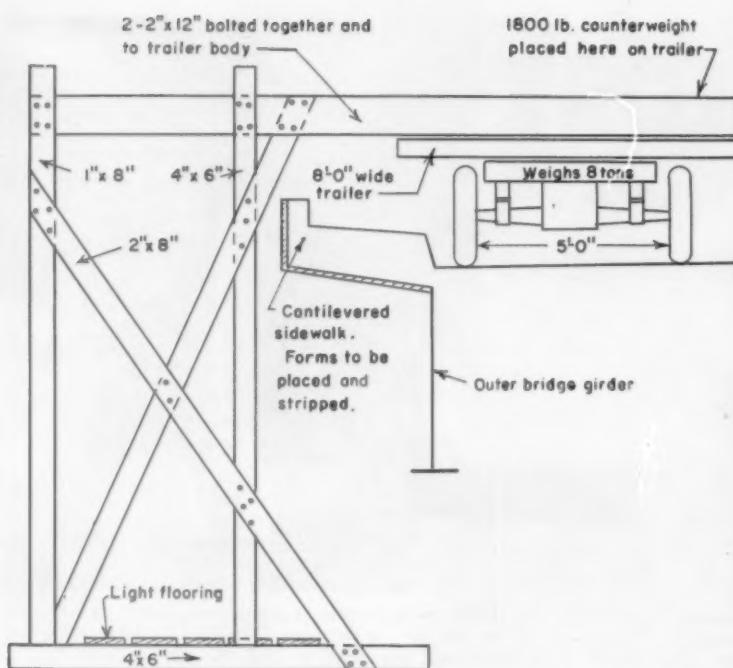
Looking east (toward Maryland) to heavy pier that will carry bascule span. Pier at right — just at approach to bascule — is only one that carries a pile cap of any kind. Other columns are uncapped, connected to each other by steelwork.



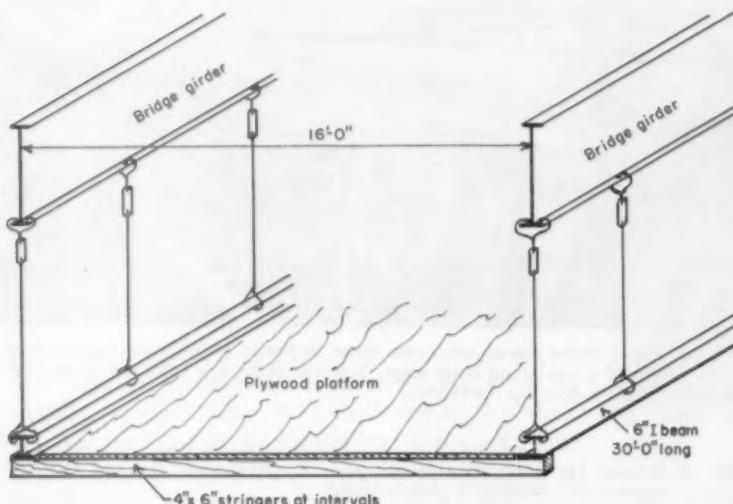
View from deck shows top of cantilever forms in place, with braces connected by walers (doubled 2 x 4) along outer edge. Sidewall of form is extended to provide guard rail during pouring operations.

Some of bracing for cantilever sidewalk pour in place, some stripped to show finished appearance. Bracing is prefabricated.





Trailer-mounted rig built to speed form placement, stripping and handling in connection with cantilevered sidewalks.



Suspension of platform for stripping and placing roadway forms.

burgh-DesMoines Steel Co. has handled steel erection on the land approaches; Phoenix Bridge Co. holds a \$3 million contract for erection of steel on most river piers and for the bascule spans. Howard, Needles, Tammen & Bergendoff are consultants.

IN MICHIGAN THE NEWSPAPERS reported recently the fact that more than 150 miles of state highways had been completed and open to traffic throughout the state during a single two-week period.

New AED Industry Directory Published

Associated Equipment Distributors has issued its 1960-1961 Industry Directory—the most comprehensive reference source and buyers guide in the field. A.E.D. is the national trade association of the construction equipment industry.

Issued every other year, the Directory was completely revised and re-edited during the 1960 autumn. The 400-page, 2½-lb. publication has four main sections: (1) Distributors, (2) Manufacturers, (3) Products, and (4) Trade Names.

The Distributor Section includes over 1600 dealers in the U.S. and Canada, showing key personnel, the company's business address, any branches, telephone numbers, and manufacturers represented.

The Manufacturer Section gives comparable data for equipment manufacturers, including products, trade names, and listing distributors of the company's line.

The Product Section includes all types of construction equipment and identifies the manufacturers; the Trade Name Section simplifies locating a manufacturer when only the product's brand name is known.

The A.E.D. Industry Directory is available from Associated Equipment Distributors, 30 E. Cedar St., Chicago 11, Ill., at \$20 per copy. If desired, add \$1.75 for first-class mail or \$2.25 for air-mail.

Iowa Students Aided

Robert A. Folkmann and Carroll E. Pingel, civil engineering students at Iowa State University have received the first two educational loan grants under the Bert Myers' Memorial Fund. The fund now totaling \$3,800 was established by friends of the late Bert Myers, former materials engineer, Iowa state highway commission. It is administered by a committee of chief engineer L. M. Clauson; A. F. Faul, materials engineer; and Don Zierath, personnel engineer.

PCA in Honolulu

The Hawaiian Cement Corporation has been elected to membership in the Portland Cement Association. PCA has established a Hawaiian district with Joe V. Williams, Jr., as district engineer.



Planners of the 1963 Show, gathered recently in Chicago: Seated) : M. E. Thayer, Manager, International Amphitheatre; Mayor Daley, Donald V. Buttenheim, Buttenheim Publishing Corporation. (Standing) : Boyd S. Oberlink, senior vice president, Allis-Chalmers Mfg. Co. (Chairman, CIMA Road Show Committee); Nello L. Teer, Jr., Nello L. Teer Company, Durham, N.C., and president, American Road Builders' Association; Julien R. Steelman, president, Koehring Company, and chairman, International Road Fed-

eration; M. Clare Miller, San Ore Construction Company, McPherson, Kans. and President-elect, Associated General Contractors' of America; R. F. Newlin, Newlin Machinery Corporation, Kansas City, Kans., and senior vice president, Associated Equipment Distributors; Harry J. Kipke, president, Chicago Convention Bureau; and R. P. McKenrick, executive director, Construction Industry Manufacturers Association, Chicago.

1963 Road Show Plans Launched

Well, it's settled and plans are on the way. The next Construction Equipment Exposition and Road Show will be held in Chicago in February, 1963. To nail down space for this gigantic industry show, The Construction Industry Manufacturers Association (CIMA) has signed for 537,000 square feet of exhibit space in the International Amphitheatre.

This will be the largest indoor industrial exhibit in the world. It will be produced and managed by the Construction Industry Manufacturers Association, and for the first time will bring together all of the various groups associated with the construction industry as co-sponsors of a construction equipment exposition.

The co-sponsoring organizations are: The American Road Builders' Association, The Associated General Contractors of America, The International Road Federation, and the Associated Equipment Distributors. Nationally known officers of each of these groups represented them at the space-signing ceremony. World wide attendance is expected.

This exhibit of construction machinery and equipment, previously

known as the ARBA Road Show, was last held in Chicago in February, 1957, when it was attended by over 67,000 including 4,000 overseas visitors. The weight of the \$12 million of construction machinery displayed at that time by 277 manufacturers exceeded 7,000 tons, and was brought into the Amphitheatre in 702 truckloads, 112 rail cars.

The change in the name from ARBA Road Show to Construction Equipment Exposition and Road Show was dictated by the desirability of all interested groups to broaden the base of this Show to encompass all phases of the construction industry as well as road building. It is anticipated that the name change will remove any previous limiting influence. The 1963 Show under the broad co-sponsorship by the various industry groups will greatly surpass the 1957 show.

The opening ceremonies for the Exposition are scheduled for noon on Saturday, February 23, 1963. Industry activities will take place prior to and during the Exposition:

- (1) The annual convention of the Associated Equipment Distributors will open Monday, Feb. 18.
- (2) The American Road Build-

ers' Association will begin their technical sessions and general meetings on Sunday, February 24.

(3) Seminars will be conducted by the International Road Federation for the overseas visitors from 70 countries.

The annual meeting of the Construction Industry Manufacturers Association, the annual convention of the National Bituminous Concrete Association, meetings of various committees, Industry Bureaus, Industry-wide councils and group meetings of inter-industry joint committees—these events too will bring together tens of thousands of equipment and materials manufacturers, contractors, retail equipment distributors, state, federal and municipal engineers, educators, bankers, and other leaders from all over the world.

Individual association programs and a consolidated program for Construction Equipment Exposition Week will be prepared and widely distributed. The CIMA Committees which will conduct the Exposition and those including representation from all sponsoring groups will be announced in the near future.



New Barber-Greene

Latest addition to Barber-Greene Finisher line is a new step forward in advanced design and superior performance.

Barber-Greene's Model SA-40 is a new achievement in ease of operation and automatic features, combined with simple construction for greatest accessibility and ease of maintenance.

Its wide range of paving speeds to 100 F.P.M. and travel speeds to 4 M.P.H., together with its many other features assure the greatest tonnage production every hour—day and year of its long life.

Some of its outstanding features are shown below. Whether you are in the market now or not,

you should be familiar with all of the advantages of this completely new modern design. Your Barber-Greene distributor will gladly give you full information. No obligation.

Only Barber-Greene Offers You Five Choices
COMPACT: Model 873, paves on crawlers, travels on rubber.

GENERAL DUTY: Model 879-B and new Model SA-40.

HEAVY-DUTY: Model SA-60 on Crawlers and Model SB-60 on Pneumatics.

NEW EASE OF OPERATION.

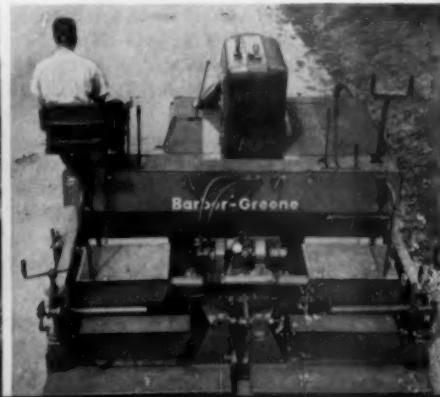
Joystick, power-assist steering. Switches on joystick control self-dumping hopper, screed hoist, etc.

HYDRAULICALLY SELF-DUMPING HOPPER.

Tunnel extends to rear of chassis for maximum capacity and fastest truck dumping. Hopper gates controlled from screed platform while paving.

HEAVY-DUTY LONGER LIFE SCREED.

Hydraulically operated, high speed tamper compacts before strike-off. Improved automatic leveling. Twin screed heaters.





SA-40 Finisher



World's No. 1 Manufacturer of Asphalt Paving Equipment

Representatives in Principal Cities of the World

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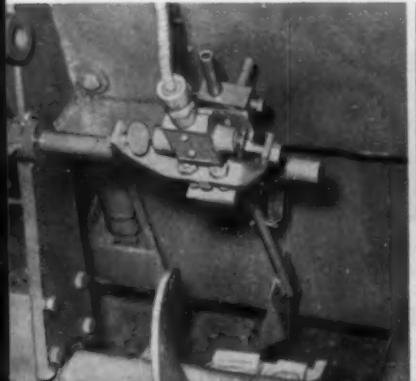
CONVEYORS • LOADERS • DITCHERS
ASPHALT PAVING EQUIPMENT

Model SA-40 paves standard 10' widths—variable from 8'-14'. Handles all asphalt mixes. Carries shift-long fuel supply in 28-gal. tank.

AUTOMATIC FEEDER CONTROL operates each pair of feeders and screws independently. Override switches on steering column.

OSCILLATING PUSH ROLLERS pick up trucks on-the-fly regardless of alignment. New long crawlers provide the ultimate in traction, leveling, and stability.

SIMPLIFIED SERVICING achieved through unitized construction and simple, efficient power train. Hinged deck plates for easy perimeter access.



Bituminous Roads And Streets

Bituminous features appear
between pages 106 through 110

Improved Heater-Planer Covers Big Daily Yardage

One hundred tons of asphalt removed in one hour . . . 5,400 square yards heater-planed in one hour . . . These two records were set recently at different air bases by the newest addition to the fleet of heater-planers operated by Jim Jackson, contractor, of Little Rock, Arkansas.

This new machine was loaded on a transport for Rapid City, South Dakota, directly out of the Weyland Machine Shop of Hot Springs, Ark., where it was built. The very first job for this new unit was on Peter Kiewit Sons' Company's contract with the Corps of Engineers at Ellsworth AFB. This job called for a large amount of heavy asphalt removal, some as deep as 4 in., all to "Blue-Top" grade. One week of the tight 6-week schedule had already been lost and both Kiewit and Air Force personnel were becoming concerned.

As it turned out, the machine handled the entire job in four

weeks, or well ahead of schedule, in spite of double quantities over original plans. Close checks made on the production indicated that on three successive days the machine exceeded 100 tons of asphalt removed per hour.

Leaving Ellsworth, the machine went directly to the Truax AFB at Madison, Wisconsin. This job called for the removal of a $\frac{1}{4}$ in. seal coat. The work was estimated to take 140 hours. Since the facility could only be closed for seven days, Jackson set up a schedule of two 10-hour shifts per day. The entire job was completed in $5\frac{1}{2}$ working hours.

As these two jobs indicate, a number of improvements are built into the heater-planer used by Jackson, who is said to be the nation's largest heater-planer contractor. This company reportedly handled three-fourths of all the contract asphalt planing done in the country last year as well as some

in Canada. The bulk of his work is a preliminary operation to resurfacing of existing asphalt pavements that have become corrugated, or are themselves re-caps that have raised roadway elevations all out of proportion to surrounding conditions. Jackson's company devotes itself entirely to the planing field and generally acts as a subcontractor on resurfacing contracts.

The machine is built around a modified Caterpillar Model 14 motor grader, weighs over 25 tons, is $4\frac{1}{2}$ ft. in length and can operate efficiently at speeds of over 125 ft. per min.

Perhaps the most important improvement over Jackson's other planers is the heating set-up. The furnace is 8' 6" long (made possible by lengthening the grader frame 31 in.), 8 ft. wide, 4' 6" high and is completely lined with cast material that reflects radiant heat on the pavement rather than a direct blast of flame.



Jim Jackson's latest heater-planer.

Six large Hauck 78R proportioning burners capable of burning 51 gph of No. 2 diesel fuel insure a good combustion mixture of fuel and air at all temperature settings with no smoke. The air is provided by a Hauck 16-11-7½ turbo blower, capacity of 950 cfm at a total pressure of 16 OSIG. Each burner is equipped with a propane gas-electric spark igniter.

As an added feature to insure against any possible damage to the existing pavement, three Chromel-Alumel thermocouples are immersed in the combustion chamber and wired to a pyrometer mounted on the dash in front of the operator. A correct, uniform heat is guaranteed over the entire heated surface with no chance left to guess-work.

The highly tempered steel cutting edges are mounted vertically behind the furnace in a "V" shape. These blades are self-sharpening and capable of an 8-ft. wide cut. Since the apex of the "V" is to the rear, stripped material is neatly windrowed in the center of the machine's cut.

A patented hydraulic loading device picks up the windrow and deposits it on a Barber-Greene belt conveyor (foldable for transport) which, in turn, loads the material into a dump truck towed along backwards by the planer.

The electric power to operate these attachments is supplied by a 15 kw Winpower generator mounted on the side of the machine. A feature of the planer is the power source for this generator: the grader engine via a Dumar power take-off—in itself, not unusual except for the rpm out-put, which constantly changes whereas the generator requires a reasonably constant in-put. To effect this, Jackson installed two Gerbing Roto-Cone variable pitch pulleys, in reverse of their normal application. They are activated by an electric motor which in turn is controlled by a Synchro-Start speed-sensitive switch. If the generator rpm goes above or below a pre-set range, the switch automatically activates the motor, changing the ratio of the pulleys to a point where the

rpm's are again back in proper range.

Two additional features soon to be incorporated into Jackson's new planer are: (1) a vacuum cleaner to pick up any fine dust that sometimes remains when planing particularly dry pavements; and (2) a spray-bar to fog on a fine film of asphalt in cases where the resurface coat will be delayed, or on maintenance jobs where no cover coat is intended. Both of these attachments will eliminate another separate operation and result in further job cost reductions.

This is the forerunner of additional planers Jackson has scheduled to build during the next five years. Because of the high production of these modern machines and the resultant decrease in square yard cost, Jackson foresees heater-planing being specified by more and more federal, state and city agencies to prepare old asphalt pavements for resurfacing. Jackson says it will take that many units to keep up with this growing demand.

Better heat beats asphalt



blending problems

Lizza Asphalt Construction Company, Oyster Bay, Long Island, cuts maintenance costs, gets top performance blending asphalt into black-top paving materials with Cleaver-Brooks Peak-Temp oil heater.

Heating 10,000 gallons of asphalt a day has been a lot easier for J. W. Slawson, superintendent of Lizza Asphalt Construction Company, since the installation of a Peak-Temp oil heater, Model CPT 500-12, in March, 1958.

"We don't have to worry about overtime costs," says Mr. Slawson.

"The fully automatic operation of this heater, plus low-pressure operation, keeps manpower requirements down. Maintenance is low, and our records show operation is efficient. The unit has run continuously (more than two years) without appreciable trouble."

For safe, low-pressure operation and continuous, automatic heating to 480°F, Peak-Temp has proved itself to be the economical solution to construction material and process heating problems. For details, write Cleaver-Brooks, Dept. P, 395 E. Keefe Ave., Milwaukee 12, Wisconsin.

Cleaver Brooks
ORIGINATOR AND LARGEST PRODUCER
OF PACKAGED BOILERS

... for more details circle 285 on enclosed return postal card

**FOR FAST, ECONOMICAL
SURFACING OR REPAIRS, USE
A McConnaughay HTD MIXER**



HTD MIXER
No. 10

Here are the mixers you need for fast, economical pavement repairs and small surfacing jobs...in any season...under wet or dry conditions. They are precisely engineered and rigidly constructed to handle on-the-job mixtures of asphaltic concrete, sheet asphalt, sand asphalt or mastic asphalt...hot or cold...at remarkably high production rates and lowest possible costs. Write for our folder on the complete line of mixers as well as for specifications and proportioning tables.



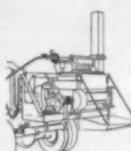
HTD MIXER No. 10
½ ton per batch



HTD MIXER No. 8
½ ton per batch



HTD MIXER No. 5
¼ ton per batch



HTD MIXER No. 4-T
½ ton per batch

McCONNAUGHAY MIXERS, INC.—LAFAYETTE, IND.

National distributors: Asphalt Equipment Co.
3314 Cherry Lane, Fort Wayne, Indiana

... for more details circle 302 on enclosed return postal card

**Moisture Studied
in Bituminous Roads**

A study to determine the allowable moisture content in bituminous concrete pavements is now under way as part of the 10-point Quality Improvement Program of the National Bituminous Concrete Association, President Bryant M. Collins has announced.

The initial step in the NBCA study will be to determine the moisture content in existing pavements located in 11 selected states covering the range of climatic conditions in the U.S. Six test samples from each of these representative states will be mailed to the Chicago Testing Laboratory, Chicago, Ill., which is under contract to conduct the research. As with similar NBCA sponsored research projects, the Chicago firm will carry on its investigation in cooperation with the Association's research co-ordinator, Charles R. Foster. States cooperating in the special project are: Alabama, California, Florida, Kentucky, Michigan, Minnesota, New York, North Carolina, Oklahoma, Texas and Washington.

The pavement samples are limited to a thickness not exceeding 5 in. including both surface and binder courses. Samples will be taken only from those highways showing satisfactory performance and selected in the traffic area of each road in a place where there is no bias from local conditions.

The new study is based on the hypothesis that hot-mix pavements accumulate a small amount of water over a period of time. Specifically, NBCA hopes to determine the *lower level* of moisture actually in the pavement samples. If the *lower level* of existing moisture approaches existing construction limits, then Association officials reason that this provides a base below which there is no need to dry the aggregate, thus enabling contractors to save in construction costs.

The Association plans to spend \$1.3 million during the first five years of its investigation into every phase of bituminous concrete construction.

A report on present studies and new projects planned will be given at NBCA's annual convention Jan. 28 through Feb. 1, in Houston, Tex.

NBCA's Research Lab Dedicated

Headquarters for the \$1.3 million research program of the National Bituminous Concrete Association were dedicated recently at ceremonies on the campus of Texas A. and M. College, College Station, Texas.

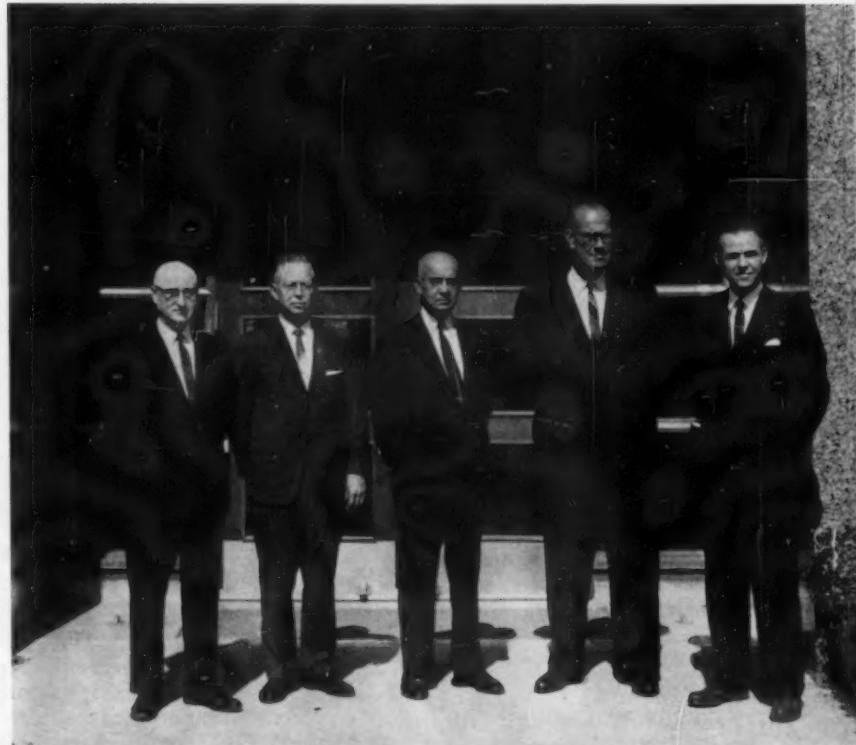
Richard R. Stander of Mansfield, Ohio, chairman of the NBCA Quality Improvement Committee, explained how the ambitious program will be conducted and maintained. Research, he said will be done by contract with private firms and universities and in cooperation with state hot-mix associations and with federal, state and local agencies.

The principal goal, Stander stated, is simply to improve the quality of the hot-mix pavement so that the public will get an even better buy for their dollar. Stander spoke in place of Bryant M. Collins of Austin, Texas, president of NBCA.

Another program speaker, Fred Benson, dean of engineering at A. & M. College and director of the Texas Transportation Institute noted specific needs for future highways: faster material testing, new type aggregates, top men at more adequate salaries; also the long-range need for better highways at economical cost.

NBCA's research headquarters are in the Highway Research Center Building on the campus. Here also are the offices and laboratories of the Texas Transportation Institute (TTI), established in 1955 by A. & M. to carry on active research in highway economics, the structural field and in the general area of highway engineering, with the Texas highway department often cooperating.

NBCA's research covers ten phases, all influential on pavement quality: producing, stockpiling and feeding aggregate to the plant; drying; methods of screening, storing and proportioning in the plant; production of the bitumi-



Present at the formal opening of the new research offices of the National Bituminous Concrete Association at Texas A. & M. College: H. S. Kerr, vice-president, construction division, H. B. Zachry Co., San Antonio, Texas, member of the NBCA Quality Improvement Committee; Charles R. Foster, NBCA's coordinator of research; Allen Snyder, president, Hefler-Snyder Co., Garwood, N. J., association treasurer; W. T. Milam, vice-president, Hunter Construction Co., Ada, Okla., committee member; and Richard R. Stander, secretary-treasurer. The Mansfield Asphalt Paving Co., Mansfield, Ohio, chairman of the Quality Improvement Committee.

nous mixture; transporting mix to paver; laydown procedure, including rolling; quality of aggregate, bituminous cement and composite mix; bases; general workmanship; and related construction practices and materials such as seal coats and additives.

Research is already under way on parts of this program. A full report on present studies plus announcements of new projects will be on the agenda at NBCA's sixth annual meeting next January

30 through February 2 in Houston, Texas.

NBCA is composed of contractors who own and operate bituminous concrete plants, plus associated materials and equipment suppliers. Charles R. Foster, coordinator of research for the association, heads the work at Texas A. & M. College. National headquarters for NBCA remain in Washington, D. C., under H. K. Griffith, executive director.

ASTM Convention: Committee D-4 Reports on Bituminous Paving Problems

A session sponsored by Committee D-4 on Road and Paving Materials at the ASTM 63rd annual meeting at Atlantic City, New Jersey, June 26 to July 1, 1960, made valuable contributions to engineering knowledge in this field. Some of the highlights:

1. J. A. Carpenter, Standard Oil Company of California, described the stress-deformation characteristics of sand-bituminous mixtures. As a result of tests he believes the strength characteristics of fine-grained, cohesionless soils do not differ appreciably from those exhibited by granular base-course materials. The initial density greatly affects the peak frictional characteristics of cohesionless soils, but ultimately, with strain, both initially dense and initially loose specimens will exhibit the same ultimate strength.

2. Ralph W. Kiefer, Cornell University reported on the results of a program involving the compaction of specimens at several temperatures using the Hveem kneading compactor. He showed that an increase in compaction temperature produced a measurable increase in specific gravity and a decrease in percent voids. This means that all specifications based on results of laboratory compaction tests should include a laboratory compaction temperature in order to give reproducible results.

3. The permeability of asphaltic concrete pavements to air and water is a primary factor in controlling pavement durability, according to W. H. Ellis and R. J. Schmidt, California Research Corp. In their paper, the authors described a new method of measurement that combines the features of being portable and rapid, which is suitable for testing either cores or

pavements in any place. The method is based on a head of water which maintains a small constant pressure drop through the pavement or core.

4. The influence of asphalt composition on its rheological properties was the subject of a paper by R. S. Winniford, California Research Corp. The author presented an outline of asphalt rheology using the fundamental units of stress and shear rate, including the effects of time and temperature. He then explained the phenomena in terms of the composition of the asphalt. One of the significant features was that the asphalt which has a high asphaltene content will have a high viscosity at elevated temperature, but at the same time it does not need to be highly thixotropic.

5. The varied experience during many years has shown that asphalt emulsions must be suited to widely varying types of construction. K. E. McConaughay, K. E. McConaughay, Inc., presented data which point out the inadequacy of current ASTM specifications for emulsified asphalts. He proposed test methods of a functional or simulated service nature rather than of the empirical type presently used, so framed that the same functional requirements would apply regardless of whether the emulsion was anionic, nonionic, or cationic in nature. The author also felt that maximum limit of asphalt content now used is not realistic for a wide range of asphalt sources and recommended that such limits be deleted.

6. E. W. Mertens, California Research Corp., and L. D. Coyne and E. D. Rogers, American Bitumuls and Asphalt Co., pointed out the lack of availability of proper test methods and specifications for the new cationic asphalt emulsions.

Tests that have been found useful in evaluating these emulsions were described, as well as modifications of existing ASTM test methods which would make them more useful.

7. At its June, 1960, meeting Committee D-4 reported that a method of test for determining the rate of curing of cutback asphalts by the rolling ball viscometer method was being developed. This is the first known attempt to measure the rate of cure in terms of change in viscosity. The proposed method is still subject to study and letter ballot by the subcommittee and probably will not be ready for presentation to the Society for adoption for another year.

8. Since the committee is presently focusing attention on viscosity, it will sponsor a symposium on microviscometry methods and techniques at the 1961 annual meeting to be followed by a symposium on kinematic viscosity at the 1962 annual meeting.

9. Continuing to place emphasis on precision (and precision statements) in methods of test, Committee D-4 has established a joint activity with Committee D-8 on Bituminous Materials for Roofing, Waterproofing, and Related Building or Industrial uses for the establishment of a uniform style for precision statements.

Officers elected for two-year terms are: A. B. Cornthwaite, Virginia Department of Highways, chairman; R. E. Bollen, Highway Research Board, 1st vice-chairman; J. E. Gray, National Crushed Stone Association, Inc., 2nd vice-chairman; J. L. Wilks, Emulsified Asphalt Refining Co., 3rd vice-chairman; B. F. Kallas, The Asphalt Institute, general secretary; and D. W. Lewis, National Slag Association, membership secretary.



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The Maine Turnpike is another example of how Asphalt supplied by Esso helped build a better road at lower costs. The Maine Turnpike Authority saved more than \$21,000 per mile over equivalent slab type construction. Compare these advantages:

● **Unsurpassed quality** — Asphalt produced by Esso is specially refined from selected crudes to provide maximum pavement strength to resist heavy axle loads and the effects of severe frost.

● **Faster construction time** — No joints, forms, frost protection covering, or curing time required to develop full strength. More road can be completed during working months for earlier opening to traffic.

● **Winter weather resistance** — Asphalt seals out moisture and is unharmed by de-icing salts. Snow and ice naturally melt away faster, too.

● **Greater planning flexibility** — Asphalt provides low-cost flexibility in meeting traffic needs. Strengthening and widening of pavements can be accomplished, providing unlimited years of service, without interrupting traffic.

Can Asphalt supplied by Esso help you build a better road at a lower price . . . with lower maintenance costs? For more information, or technical assistance in your road building plans, write: Asphalt Products, Esso Standard, Division of Humble Oil & Refining Company, 15 West 51st Street, New York 19, New York.



ASPHALT PRODUCTS

In Industry after Industry... "ESSO RESEARCH works wonders with oil!"

NEW PRODUCTS

Listed here are reviews of new and improved equipment items, selected to aid our readers in purchasing. See reader service numbers on enclosed postcard.*



Smith's Rubber Tired Finisher—102 ft. per min.

Asphalt Finishers

The first in a line of bituminous finishers to be offered by the T. L. Smith Co. of Milwaukee was announced recently.

Designated the Mark IV, it boosts a 400 ton per hr. capacity along with many engineering improvements. The new unit is mounted on rubber tires for smooth, fast operation. Paving speeds of up to 102 ft. per minute and traveling speeds up to 10 mph. are reported by the company. This, combined with front and rear wheel steering promises exceptional maneuverability and ease of handling. Smith states that paving around sharp curves and next to curbing will be faster and more uniform. Swept back screed for faster distribution and a swinging operator's platform are additional features which incorporate folding side-wings on the hopper to permit trucks of all sizes to unload mix with minimum spillage and eliminate hand shoveling.

This new Smith product was developed by the Advance Construction Equipment Mfg. Corp., recently purchased by Smith. The earlier purchase of the L. O. Gregory Mfg. Co. puts Smith in both the concrete

batching as well as asphalt batching equipment manufacture.

T. L. Smith Co., 2835 N. 32nd St., Milwaukee, Wis.

For more details circle 101 on Enclosed Return Postal Card.

Safety Hat Winter Liners

Six new safety hat winter liners are now available from Jackson Products, Air Reduction Sales Co.

All ruggedly designed for outdoor industrial activities, these new liners are offered in a wide range of styles. All the new liners are reported to fit all hats, workers and feature lightweight durable materials for warmth and ease of washing. The new metal-



Jackson Winter Liner

*To readers outside of the United States—postal rules forbid use of business reply cards outside of the U.S. Please write to us listing the numbers, month and name of magazine, and mail with your name and address to Inquiry Dept., Roads and Streets, 22 W. Maple St., Chicago 10, Ill., U.S.A.

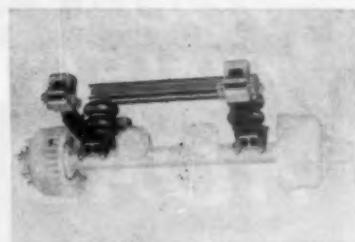
free design of the liners permits their use by any worker exposed to electrical shock hazards. Styles include Model FC-2 with $\frac{3}{8}$ in. deep all-orlon pile lining and model FC-4 which features a removable ear flap that attaches to cap with an all-plastic zipper.

Jackson Products, Air Reduction Sales Co., 31739 Mound Rd., Warren, Mich.

For more details circle 102 on Enclosed Return Postal Card.

Equal Ride Trailers

Manufacturer of truck and trailer components, Western Unit Corp. recently introduced their model SA-107 "Equal Ride" suspension for semi's and trailers. The new unit is engineered to take care of the tremendous difference between the empty and loaded weight



Western's Equal Ride

of the trailer and smooth out the ride under all operating conditions.

Air in the air cushions can be pre-set to carry the empty trailer weight. The leaf springs and air cushions together carry the combined weight of the trailer and payload.

Western Unit Corp., 17747 E Railroad St., City of Industry, Calif.

For more details circle 103 on Enclosed Return Postal Card.

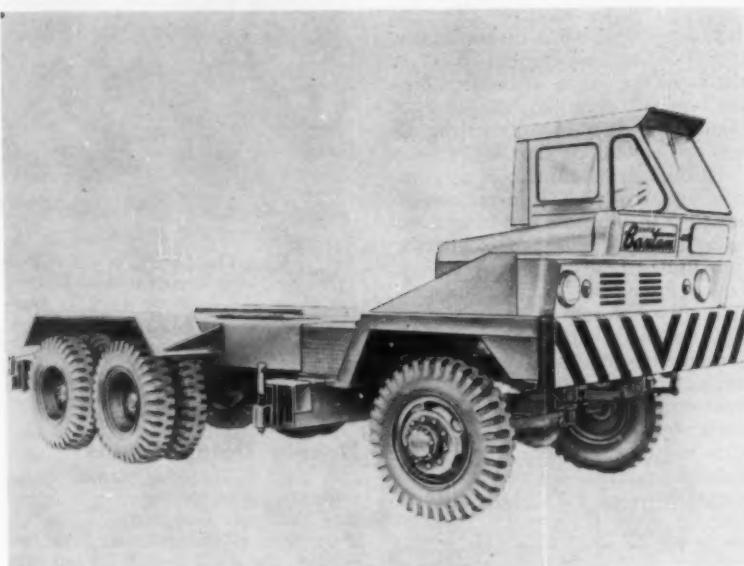
Asphalt Plant Control

A new automatic drier burner control system for use with asphalt plant drier units where close temperature control of dried aggregate is desired, was announced by Iowa Mfg. Co. The new drier burner control consists of three units each of which represents one phase of the control. Operation of the control is flexible because the control system can be either automatic or manual and the type of operation can be chosen by the operator.

Iowa Mfg. Co., Cedar Rapids, Iowa

For more details circle 104 on Enclosed Return Postal Card.

New Products



Bantam's Model 406 Carrier

Crane-Carrier

A new maximum-duty crane carrier model has been designed for mounting of the 11 ton capacity Model T-350 Bantam upper unit.

Designated the Model 406, it is reputed to offer maximum stability for long boom, big reach crane jobs. Standard features of the new model include 220 hp. V-8 engine, air brakes on all wheels and power steering. The frame is 15 x 6 in. box section. Optional center and rear outriggers are 6 in. x 11 in. double box by-passing type. A bulletin #A-303 is available upon request.

Shield Bantam Co., Waverly, Iowa

For more details circle 105 on
Enclosed Return Postal Card.

Transit Mixers

A new line of transit mixers has been introduced by Blaw-Knox Co.

Nicknamed the "BuKaneer", it ranges in size from 4 to 10 cu. yd. and are available with fly wheel power take-off, front engine power take-off and separate engine power trains. All transmissions feature 4 forward and reverse



Blaw-Knox Transit Mixer

Rubber Highway Dividers

An all new flexible material which has been developed for highway dividers was recently announced by Pylacon, Inc.

The new dividers, called jiggle bars, are extruded from special butyl polymer compound impregnated throughout with federal yellow. One advantage of the material is that it can be supplied in stock lengths of 16 ft. with sufficient anchoring materials which give the user the opportunity of cutting the material to fit their particular need. They can also be removed and re-used



Pylacon Rubber Road Dividers

and are said to eliminate the necessity of patching the surface removed after removal. The dividers are also reported to be no danger to snow plows if struck in winter. The device is anchored to the pavement with mushroom I head anchor rods or epoxy resin material.

Pylacon, Inc., 48 N. Westwood Ave., Toledo 7, Ohio

For more details circle 107 on
Enclosed Return Postal Card.



Powered by a 550 hp. Cummins V-12 Diesel, this new LeTourneau-Westinghouse end-dump is reputed capable of carrying twice its own weight—comes equipped with a 6 speed transmission and has a top speed of 46.6 mph.

LeTourneau-Westinghouse Co., 2301 N.E., Adams St., Peoria, Ill.

For more details circle 108 on
Enclosed Return Postal Card.

Asphalt Plant Design for Pick-Up-and-Go

Literally "circus parade" portability, is high on the list of goals in asphalt mix plant design and this goal has been achieved in a new continuous-mix, high-capacity plant just announced by Barber-Greene.

Basically a Model 848-A B-G Plant, the "Circus" plant may consist of any necessary number of plant components; mixer, dryer, dust collector, as demanded by job needs. The difference between standard model 848-A and this new plant lies in accessory and optional equipment, which is added to achieve the unusually high degree of portability, ease and speed of erection and dismantling and efficiency in operation.

Automatic operation features include: remote control operation of the mixer and automatic burner controls on the dryer; automatic discharge of the mixer surge hopper with manual override from the remote control station; automatic shut-down of the mixer if the gradation control unit bins are low, and a fully automatic one-button emergency stop through which all power units are interlocked electrically.

Self contained plant power is achieved by three diesel power units. One drives the mixer and gradation control unit and hot ele-

vators, a second drives the dust collector and dryer, and the third powers a 75 kw electric generator. It is possible to effect instantaneous change of asphalt content in mixes through use of a variable speed mechanical drive to the asphalt metering pump. A dial setting alters the asphalt content.

Rubber tire mounting of all components with dollies permanently attached to elevators and hinged exhaust stacks on the dust collector contribute to the plant's portability. Levels for accurate set-up are permanently mounted. Electric wiring and panels for each component are permanently mounted with quick-connect fittings linking each. Remote control station and the automatic burner controls allow one man to serve both as mixer and dryer attendant.

Barber-Greene Co., Aurora, Ill.

For more details circle 109 on Enclosed Return Postal Card.

End Loader

A 3000 lb. capacity end loader with 49 hp. all wheel drive was announced by Detroit Tractor Ltd.

Featured is maximum visibility and maneuverability, states the company. The unit is said to have a short turning radius, good traction and general off the highway versatility. Designated the 44-35 Tractor Loader, it has a self-leveling bucket, positive fast double acting hydraulics, 49 in. reach, and dump angle of 48 deg. with 6 ft. under the



Detroit's End Loader

bucket lip. The bucket is a standard $\frac{3}{4}$ cu. yd.; attachments such as forklift, bulldozer and backhoe are also available.

Detroit Tractor Ltd., 1221 E. Deating Ave., Muskegon, Mich.

For more details circle 110 on Enclosed Return Postal Card.

Bottom Dump Trucks

A new lightweight bottom dump train for full width spreading of aggregate and road base material was announced by Challenge-Cooke Bros. Inc.

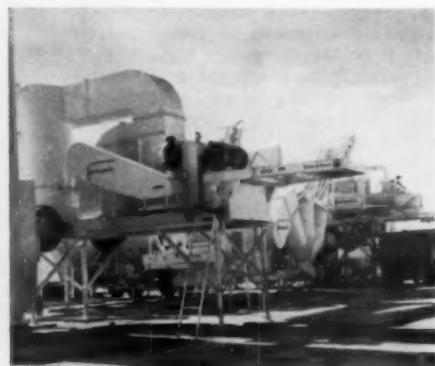
The train is engineered for use with standard 2 axle tractors and will haul up to 28 tons legal payloads. Vertical hopper sides together with big 20 in. by 86 in. gates permit the driver to spread material a full 8 ft. wide. Positive 2 way gate control from inside the cab provides precision control of material to uniform desired depth while the train is on-the-move.

Challenge-Cook Bros., Inc., 3334 San Fernando Rd., Los Angeles 65, Calif.

For more details circle 111 on Enclosed Return Postal Card.



One unit following closely behind the next, the Barber-Greene "Circus" arrives on its own wheels, is erected with one crane and stands awaiting its first job—it can retreat as quickly.





A new 25 ton capacity HC-77 truck-crane recently introduced by Link-Belt Speeder Corp. With a working weight of about 56,000 lb. and an 8 ft. over-all width, this unit can travel most highways legally without stripping.

Link-Belt Speeder Corp., 1201 Sixth St. S.W., Cedar Rapids, Iowa

For more details circle 112 on
Enclosed Return Postal Card.

Portable Batch Plant

A 30 ton decumulative portable cement batch plant of a new design has been introduced by the Ross Porta-Plant Co.

The plant has been designed to be set up in an hour and requires only a small dirt ramp to make it accessible to front-end loader charging. The overhead bin combined with the decumulative weigh system eliminates the need for a weigh batch bin. This, reports the manufacturer, allows several batches of concrete to be weighed out without



Porta-Plant 30 Ton Batcher

re-charging the storage bin. Batches up to 7 yd. can be weighed in one operation. The low profile eliminates the need for crane or belt elevation charging. The plant is reported to easily produce 60 yd. of concrete per hour.

Ross Porta-Plant, Box 446, Brownwood, Texas

For more details circle 113 on
Enclosed Return Postal Card.

Aggregate Scale

Production of the new Rex Auto Agg-Weigher for fast, one-stop charging and weighing of aggregate has been announced by the Chain Belt Co.

Portable and ruggedly designed especially for sand and gravel operators, the



Rex Auto Agg Weigher

unit has the outstanding feature of eliminating the platform scale. It also eliminates the stop at the scale, allowing a truck driver to charge and weigh aggregate himself by pushing a button. The device may operate on either a pound or ton basis and can weigh up to 720 tons of aggregate per hour. This is reported to eliminate the possibility of overloading or short shipment.

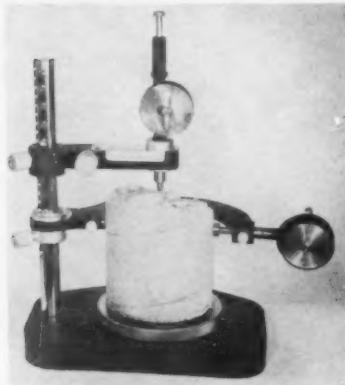
Chain Belt Co., Milwaukee 1, Wis.

For more details circle 114 on
Enclosed Return Postal Card.

Core Length Diameter Indicator

A new measuring indicator for quickly and accurately determining the length and diameter of drilled concrete cores to be used for testing is now available from Soilttest, Inc.

Concrete samples are core drilled from pavements, floors, walls and similar concrete structures and the samples used for checking the complete work with construction specifications as to thickness, quality and strength. The new measurement indicator is designed to enable highway and construction



Soilttest Length/Diameter Indicator

engineers to check cores rapidly and with consistently accurate results. The indexing rotary table locks into 8 positions for measuring the core length up to 12 in. The portion of the indicator for measurement of diameter is detachable, thus making two independent measuring units for diameter and length.

Soilttest, Inc., 4711 W. North Ave., Chicago 39, Ill.

For more details circle 115 on
Enclosed Return Postal Card.

Infrared Phone

A new communication system that uses principles of missile detection to send telephone-like conversations hundreds of yards without wires was introduced by Infrared Industries, Inc.

In operation, the hand-held, self-powered Infraphone, about the size of a home movie camera, can be aimed at another unit anywhere within its line-of-sight. The invisible beam carries the conversation between the two units. Both phones are identical transmitter-receiver units, and talking and listening may be simultaneous, as with a telephone. These units are reported not subject to FCC regulations. A pistol grip and tubular rifle-like sight facilitates holding and aiming. The device weighs less than 26 oz.

Infrared Industries, Inc., Waltham, Mass.

For more details circle 116 on
Enclosed Return Postal Card.

Continued on page 118



CF&I CUTTING EDGES

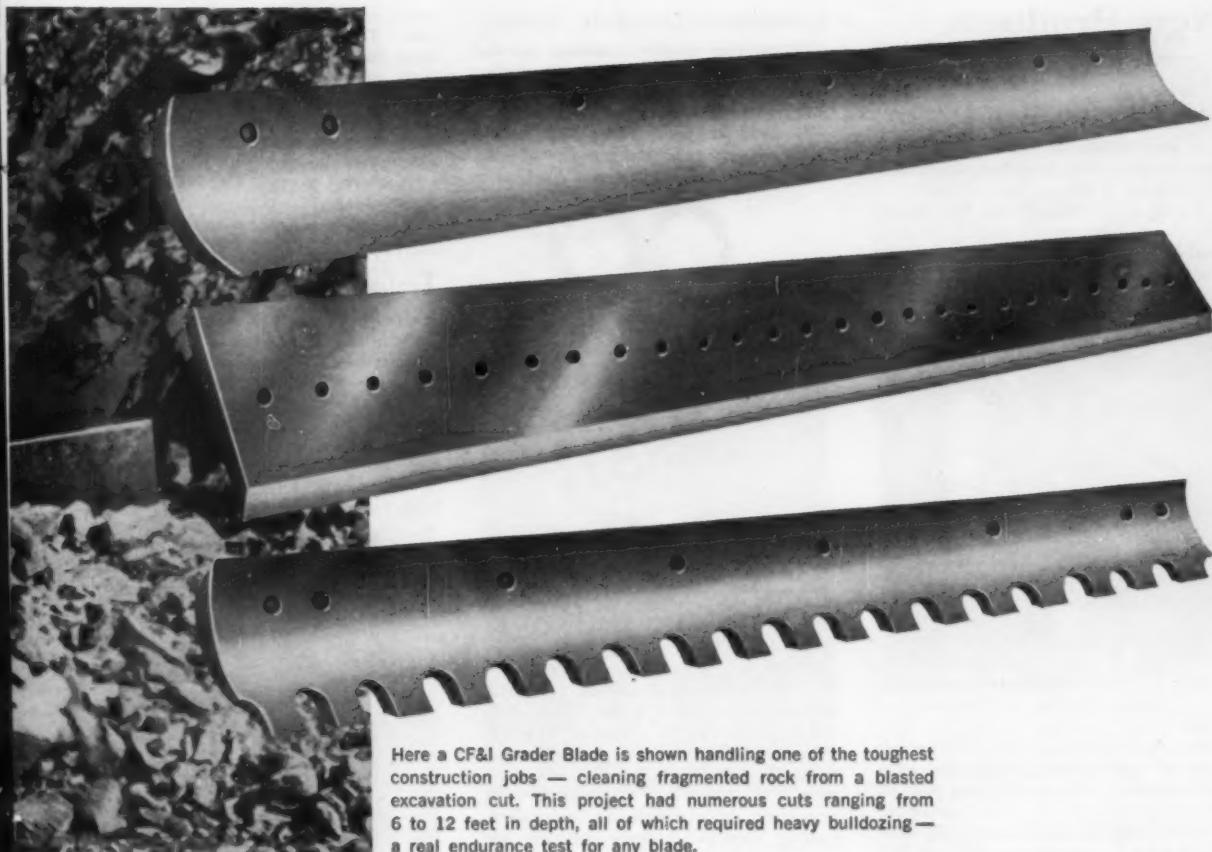
*proved superior
by comparison
in rugged country*

■ A valuable piece of earthmoving equipment and a top-notch operator represent a considerable investment . . . but they won't give you a satisfactory return on your investment if the cutting edge on the mold-board fails to do its job. That's one of the reasons why construction and maintenance men who have compared *quality*, specify CF&I Grader Blades and Cutting Edges.

Here's an example given by a large user of cutting edges in rugged country where costs and equipment downtime really count. Over 1600 miles of road must constantly be maintained and rebuilt in one of the largest counties* in the Pacific Northwest. In their year-round battle with the elements, the highway department faces the extremes of low valley roads and high mountain passes . . . plus the problems of torrential rains that cut deep gullies, and blizzards that bury almost half of their roads under frozen drifts. They must be prepared to handle the thick muck in the river valley as well as the scab rock, boulders and lava at the higher elevations. In this rugged county the tools of maintenance are vital!

For the past twelve years, the department has

*Additional information on request.



Here a CF&I Grader Blade is shown handling one of the toughest construction jobs — cleaning fragmented rock from a blasted excavation cut. This project had numerous cuts ranging from 6 to 12 feet in depth, all of which required heavy bulldozing — a real endurance test for any blade.

experimented with nearly every blade on the market. At times, competing blades have been mounted side by side with CF&I blades on various types of equipment and tested against all kinds of conditions. They found that purchasing inferior blades is costly because the ends chipped and brittle edges broke in small half circles and wore rapidly. As a result **THEIR FIRST CHOICE IN CUTTING EDGES IS CF&I.**

CF&I Cutting Edges are scientifically designed and carefully manufactured to give long, trouble-free service. They are made of special-analysis, new billet, open hearth steel, to assure high abrasion and fatigue resistance. They are cold drilled and punched to preserve the original properties of the steel, with no hard or soft spots.

Whatever your requirements may be, CF&I main-

tains nation-wide inventories of all kinds of blades and cutting edges through its many distributors. For complete details contact one of them or your nearest CF&I sales office.

CF&I products for the construction industry:

Cal-Tie Wire • Cutting Edges • Fence (Chain Link and Right-of-Way) • Galvanized Steel Strand • Grinding Rods • Grizzly Bars • Merchant Bars and Shapes • Nails and Staples • Plate Parts • Prestressed Concrete Strand and Wire • Rebars • Rock Bolts and Metallic Fabric • Screen Bars • Structural Shapes • Stucco Netting • Vibrating Screens • Welded Steel Pipe • Welded Wire Fabric • Wire Rods • Wire Rope

For complete information on all products, ask for Catalog G-104, "CF&I Steel Products for the Construction Industry."



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Pueblo • Salt Lake City • San Francisco • San Leandro • Seattle • Spokane • Wichita

In the East: WICKWIRE SPENCER STEEL DIVISION—Atlanta • Boston • Buffalo • Chicago • Detroit • New Orleans • New York • Phila.

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ROADS AND STREETS, December, 1960

7000-A

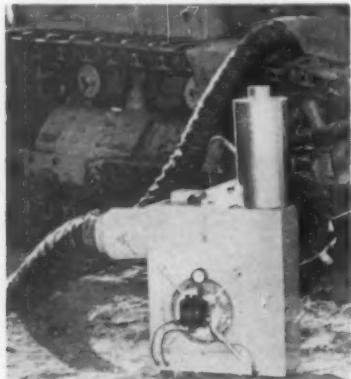
New Products

Continued from page 115

Flexible Arm Heaters

A new hot-air heater with a flexible arm to direct the heat was announced by Flexible Tubing Corp., Conn.

Using a Morrison-Pelsue Co. heater, the arm is light weight and 15 ft. long, enabling the heat to be directed under the hood of a truck or into the engine of a tractor. The whole arm retracts



Flexible Tubing on Heater

into a 26 in. carrying case. The arm is made of high carbon spring steel wire helix covered with overlapping plies of fabric coated with du Pont neoprene synthetic rubber. The device will handle 1200 cu. ft. per minute and arrangement for using two hoses at the same time can be made.

Flexible Tubing Corp., Guilford, Conn.

For more details circle 117 on Enclosed Return Postal Card.

Flexible Traffic Marker

A flexible traffic marker is now available from Nationwide Traffic Engineering.

Made with long-lasting "Hypalon" synthetic rubber, the brilliant yellow tubular marker snaps back if hit by a car or other vehicle. It stands erect through its service life, but avoids damage to tires or fenders caused by pipes or other rigid markers. The body of the marker is a 16 in. tube of elastomer, $2\frac{1}{2}$ in. in dia. and mounted on metal or epoxy compounds. The ability of the markers to be dismounted and moved is a major advantage, permitting ready revision of traffic control plans without unnecessary expense. Temporary traffic measures on construction sites can be put in effect economically. Alternate installation on concrete pavement features a power-driven anchoring stud to which the tube can be attached.

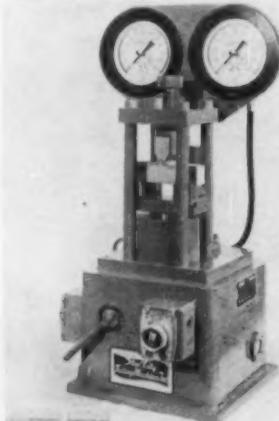
Nationwide Traffic Engineering Co., Inc., 2535 Mount Carmel Ave., Glenside, Pa.

For more details circle 118 on Enclosed Return Postal Card.

Transverse Concrete Tester

Transverse testing machines for determining the flexural strength of concrete specimens are now available from Steel City Testing Machines, Inc.

Designated Model TF-179, the bench-mounted testers have a capacity of 2000 lb. They apply a uniform load at a



Steel City Tester

pre-set rate, which can be varied to suit different requirements. Flexural tests conform to ASTM Standards. The load is set at 600 lb. per min. The machines are hydraulically operated, with the hydraulic system located within the base, and powered by 1/6th hp. motors operating on 110 volt, 60 cycle alternating current. Simple controls are conveniently located on the front of the base for ease of operation.

Steel City Testing Machines, Inc., 8817 Lyndon Ave., Detroit 38, Mich.

For more details circle 119 on Enclosed Return Postal Card.

High Conveyor Capacity

A new line of construction equipment, a high mobile belt loader which is capable of pouring 3,500 tons of material per hr. into hauling units was announced by Western Conveyor Co.

Features of the new model loader are a continuous belt and internal hydraulically-operated gate control and feeder. The positive hydraulic cut-off of the discharge gate and feeder prevents dribbling or spilling of materials between loading discharges, and the continuous running belt eliminates shear and starting load. Another feature of the Wescon high tonnage mobile belt loader is location of the fifth wheel pin under the discharge end, permitting hook-up and movement by



Western's 3,500 Ton per Hr. Wescon

truck without crane lift or tractor pull-out. The unit is equipped with tandem dual wheels to carry its 64,000 lb. bulk, and is hauled intact by standard hauling equipment as a permit load. The loader can be set up by a two-man crew and be ready for operation in about two hours.

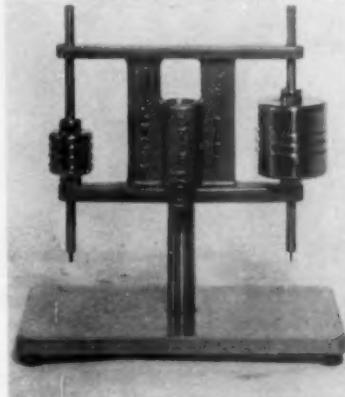
Western Conveyor Co., P.O. Box 357, Boise, Idaho

For more details circle 120 on Enclosed Return Postal Card.

Testing Apparatus

Greater mechanical stability has been built into a new design of the Gillmore Apparatus for cement testing now being made by Soiltest, Inc.

The apparatus determines the time of set of cement by determining at what time test specimens of the cement will bear the point of weighted needle. A $\frac{1}{4}$ lb. needle determines the time of initial set while another needle weigh-



Gillmore Testing Apparatus

ing 1 lb. determines the time of final set. In its redesign of the apparatus, the manufacturer has employed one-piece construction of the cross arms and needle supports to eliminate possible binding of the needles. It has also used a pin guide arrangement to prevent a rotation of the cross arms that could deflect the proper angle of the needles.

Soiltest, Inc., 4711 W. North Ave., Chicago 39, Ill.

For more details circle 121 on Enclosed Return Postal Card.

Auxiliary Transmissions

Two new four-speed auxiliary transmissions for medium and heavy duty trucks and tractors have been announced by Fuller Mfg. Co.

With overdrive, direct, low and low-low in one compact, 375 lb. unit, the Fuller 4-B-73 is designed for use with engines producing approximately 500-600 lb./ft. of torque. Use of special high-capacity bearings permits the unit to be used with engines in the 600-700 lb./ft. torque class.

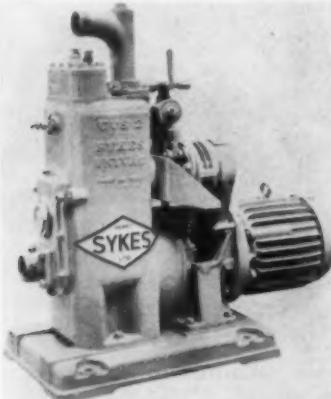
Fuller Mfg. Co., Transmission Div., Kalamazoo, Mich.

For more details circle 122 on Enclosed Return Postal Card.

Univac Pump

An electrically operated 2 in. univac self-priming centrifugal pump is now being produced by Henry Sykes Ltd., London.

With a capacity of 6,500 gph. when operating on a suction lift of 10 ft. and a nominal lift of 8,000 gph. at 8,000 ft., the pump is reported to pass solids of up to 1 in. The operating principle consists of the maintenance of a partial vacuum in two chambers which are above the center line. The pump is close coupled to a 3 hp. English electric



Sykes Univac Pump

3 phase 50 cycle 400/440 volt motor. Other motors may be fitted. The overall length of the unit is 3 ft., the width is 1 ft. 6 in. and it stands 3 ft high.

Henry Sykes Ltd., Southwark St., London, S.E. 1, England

For more details circle 123 on Enclosed Return Postal Card.

Masonry Saw

A new E/E Tru-Matic masonry saw has been announced by Engineered Equipment, Inc.

It has many new features of automatic nature, such as a new self-positioning blade guard—always parallel to conveyor cart regardless of head height adjustments—whether jam cutting or step cutting and instantaneous height adjustment eliminating cranks and leverage arrangements. The saw also features true alignment assuring precision cutting because of the method in which the head is rigidly locked in posi-



E/E Trumatic Saw

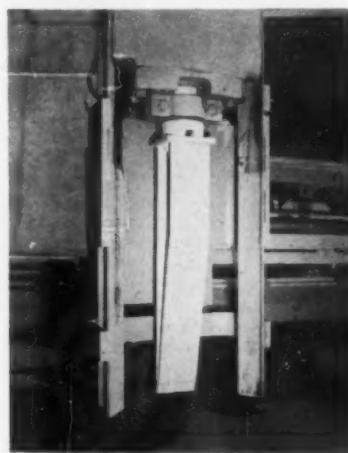
tion. Saws are equipped to accommodate an optionally available longitudinal track upon which conveyor cart is allowed to carry material for accurate long cuts.

E/E Tru-matic Masonry Saw, Box 726, Waterloo, Iowa

For more details circle 124 on Enclosed Return Postal Card.

Frost Chisel

A new cutting tool, specially designed to work in deep frost, is now being produced by Arrow Mfg. Co., Denver, Colo. The new frost chisel,



Arrow Frost Chisel

used as a tool on the Arrow Mobile Hydraulic Hammer, makes possible economical working of frozen ground on many jobs where other types of equipment cannot operate successfully.

Attached to the Arrow hammer, the frost chisel can be repeatedly dropped with a force of as much as 9000 ft. lb. to penetrate the deepest frost. The manufacturer reports that this tool is also being successfully used as an economical means of cutting shale.

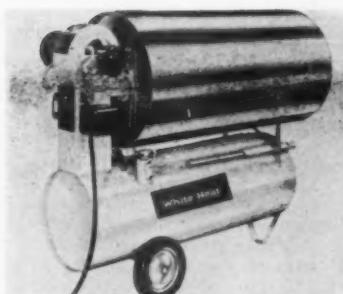
Arrow Manufacturing Co., 194 W. Dakota Ave., Denver 9, Colo.

For more details circle 125 on Enclosed Return Postal Card.

Portable Heater

The addition of a new model to their line of portable construction heaters has been released by White Mfg. Co., Inc.

The new White heater, Model H-3, has a capacity of 350,000 btu's per hr. featuring a pass stainless steel combustion chamber that burns all objectionable odors and smoke. This should permit clean, odorless operation with no visible flame. Air is supplied by a furnace-type blower in place of a fan or positive air circulation and quiet operation. Fuel pump, blower and motor are coupled direct, eliminating v-belts and possible slippage. A heavy constructed fuel tank will operate heater for 16 hrs. continuous operation, and longer when thermostat equipped. The White Model H-3 is available with thermostat, low fuel shut-off and flame



White Portable Heater

detector or as a manually operated heater.

White Manufacturing Company, Elkhart, Ind.

For more details circle 126 on Enclosed Return Postal Card.

Welding Electrode

A new low-alloy welding electrode, Murex Type 1013, which meets AWS and ASTM specifications for E100-13-G electrodes, has been added to the Metal & Thermit Corp., electrode line.

The electrode is designed for use in all positions on low-alloy, high tensile steel applications, using either AC or DC straight polarity. It is particularly well suited for single pass welds on SAE 4130 steels and other alloy steels in light gauges where high weld strength is desired after heat treatment. Preheating is not, manufacturer states,



IDEAL FOR... PLAT PLANS PROJECT PLANTS

File constructed in 200 lbs. test corrugated container.

9 TUBE MODEL Tube I.D. 4 1/8"

MODEL NUMBER	0930	0936	0942
Size			
13 1/2 x 13 1/2 x L	31	37	43
Inside depth	30 1/2	36 1/2	42 1/2
Price	\$11.50	\$12.00	\$12.50

16 TUBE MODEL Tube I.D. 3 1/8"

MODEL NUMBER	1630	1636	1642
Size			
13 1/2 x 13 1/2 x L	31	37	43
Inside depth	30 1/2	36 1/2	42 1/2
Price	\$12.00	\$12.50	\$13.00

Color Med. Gray • F.O.B. St. Clair Shores, Mich.
SOLD DIRECT ONLY

25 and 49 Tube model avail. Write for brochure.

ROLL & FILE SYSTEMS, INC. P. O. BOX 3863 DETROIT 5, MICH

... for more details circle 317 on enclosed return postal card

necessary except in cases involving highly restrained joints.

Metal & Thermit Corp., General Offices, Rahway, N.J.

For more details circle 127 on Enclosed Return Postal Card.

Self-Propelled Brush Cutter

A 32,000 lb. self-propelled super "lawnmower" said to be capable of cutting oak trees up to six in. thick depends on welded construction to withstand shock and stress generated in chopping a 7 ft. swath through dense underbrush.

The machine, the Marden PB-7 Brush Cutter, can clear approximately 3½ acres per hour. Twelve heavy moldboards, each holding an air-cooled 1000 steel cutting blade, are welded to each conical cutting drum. Because the blades are attached to conical drums, the cutting action of the machine encompasses both a slicing and impact effect, forcing vegetation into the



Self-propelled Brush Cutter

ground rather than scooping it up. Approximately 500 lbs. of Murex type FHP coated electrodes and Speedex iron powder electrodes are used on the drums and frame of each machine. Motive power is supplied by two 132 hp. engines which drive the two cutting drums. Simultaneous control of the two transmissions is achieved through a special hydraulically actuated control system. The transmissions, which can be reversed instantly, offer four speeds forward and four in reverse.

Metal & Thermit Corp., Rahway, N.J.

For more details circle 128 on Enclosed Return Postal Card.

Portable Screen Plant

A new, portable, unitized series of screening plants designed to relieve screening bottlenecks has been announced by Pioneer Engineering.

Model 522-E incorporates a high speed, two-bearing, two-deck, 5 ft. by 14 ft. top deck screen with spouting that allows material retained on the two decks to be combined or discharged separately. This new, high capacity plant is equipped with a mechanical feeder, go-in feed conveyor, 30 in. end delivery conveyor and 24 in. side delivery conveyor. All units are combined on a single chassis with a single rear



Pioneer's Portable Screen

axle and 5th wheel front pin or front bolster. Axle can be mounted on either end allowing plant to be towed from either end. Plant can be equipped with electric motor drives or single unit gasoline or diesel power.

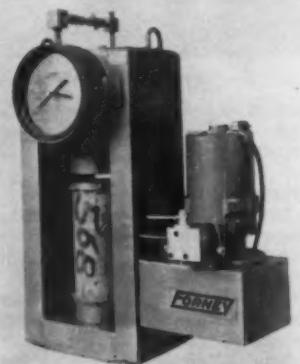
Pioneer Engineering Div., Poor & Co., Inc., 3200 Como, Minneapolis 14, Minn.

For more details circle 129 on Enclosed Return Postal Card.

Portable Compression Machine

A new Model FT-30 completely power operated portable compression machine with a variable speed of loading has been announced by Forney's Inc.

The new power control unit embodies a rapid traverse which permits fast preloading of the specimen. The speed at which a specimen is loaded can be



Forney's Compression Machine preset according to the applicable ASTM or AASHO specifications, and if desired, can be varied while the test is in progress. It is reported that with the Model FT-30, it is possible to fully conform to ASTM and AASHO specifications for rate of loading.

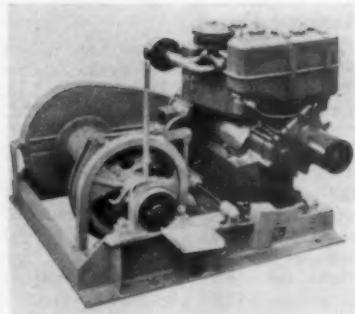
Forney's Inc., P.O. Box 310, New Castle, Pa.

For more details circle 130 on Enclosed Return Postal Card.

Power Driven Winch

A new power driven winch, reported capable of lifting a maximum load of 10 cwt., is being produced by Henry Sykes Ltd. of London.

Known as the No. 3 size in their range of single barrel winches, it is a small general purpose winch which will also operate an 8 cwt. drop hammer at 120 ft. per min. It uses a 6 in. dia. cast iron barrel with an effective length of



Sykes Power Winch

15 in. An alternative barrel of 12 in. effective length may be fitted if required. The drive from the engine is by a duplex chain. An external contracting type footbrake is fitted and the use of this unit, in conjunction with the Jackson clutch gives control where loads are required to be positioned. Both diesel and petrol engine powered versions are available.

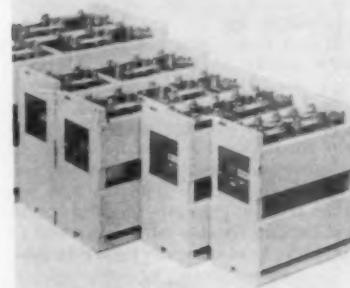
Henry Sykes Ltd., 536 Southwark St., London S.E. 1, England

For more details circle 131 on Enclosed Return Postal Card.

Nickel-Cadmium Batteries

Nickel-cadmium batteries have been added to the product line of Exide Industrial Div. of Electric Storage Co.

The new batteries, having nickel-and-cadmium-oxide active materials contained in perforated steel pockets of the positive and negative plates. Offered by the company for use in a number of specialized applications, this type of battery sometimes is a superior power source for: starting engines to generate emergency power; and emergency lighting systems. The



Nickel-Cadmium Batteries

new line is available in 22 electrical sizes, with eight-hour capacity ratings ranging from 10 to 450 amp. hr. and in other special types and sizes. The active materials of the battery plates are contained within pockets formed from perforated, nickel-plated, annealed steel strips that are folded and flanged together. The filled strips are fitted into nickel-plated steel frames to form strong plates.

Exide Industrial Div., Rising Sun and Adams Ave., Philadelphia 20, Pa.

For more details circle 132 on Enclosed Return Postal Card.



MATERIALS FOR MAINTENANCE



CUT RESURFACING PREPARATION COSTS

... renew bridge decks with latex modified mortar

Here's how you can prepare and resurface structural concrete bridge decks in less time and at lower cost using portland cement mortar modified with Dow Latex 560.

Compare these savings. Conventional resurfacing methods require that you jackhammer out at least three to four inches of old concrete across the entire surface of the bridge and lay three to four inches of new concrete.

But when you're resurfacing with latex modified portland cement mortar, *only* the areas of actual failure need be jack-hammered and sandblasted — and then only to a minimum depth of $\frac{1}{2}$ inch, or to a depth sufficient to expose a sound concrete base. This thin layer of latex modified portland cement mortar has greater adhesion to substrate and produces

a surface with greater flexural, tensile, compressive strength, greater resistance to water penetration, and higher freeze-thaw resistance than conventional concrete or asphalt resurfacing! It conforms to the expansion-contraction cycle of the original concrete, and reduces stress on the new surface.

Highway engineers, working with Dow research, have made field placements of latex modified mortar on bridges in Michigan, New York, Vermont, Texas, Ohio and several other states. For full information write for a technical report on how to apply latex modified portland cement mortar on structural concrete bridges and highways: THE DOW CHEMICAL COMPANY, Midland, Michigan, Plastics Sales Department 1958EK12.

THE DOW CHEMICAL COMPANY • MIDLAND, MICHIGAN

ROADS AND STREETS, December, 1960

... for more details circle 288 on enclosed return postal card



HOW TO KEEP DITCHER TEETH SHARP... *and get extra footage with STOODY ALLOYS!*



Two teeth with same number of hours on same machine. At left, sharpness is retained with STOODY 100; at right, edge of unprotected tooth is blunted.



1 Line up several teeth against a tilted carbon block. Cutting edges should be approximately level and teeth closely butted.

... for more details circle 310 on enclosed return postal card

122

Dull teeth and frequent changes take the profit out of ditching operations. The answer—hard-face teeth before they are installed and repeat the hard-facing as they wear.



2 Now make a continuous pass of STOODY 100 applied semi-automatically along cutting edge, tying all teeth together. Second pass of STOODY 100 is molded to sharp edge by carbon block beneath. Dropping teeth flat on concrete floor breaks them apart. This welding technique saves time, keeps sides square without individual welding attention. Same system can be used with standard Stoody manual electrodes.

A Texas contractor follows this plan, uses the semi-automatic welder applying STOODY 100 to keep teeth sharp longer and reduce time out for changes. The photos show how it's done. *This contractor has found that teeth protected with STOODY 100 working in limestone and shale are good for better than 150 hours, while unprotected teeth are worn to destruction in 30 hours with several sharpenings necessary in-between.*

Many operators of ditching equipment operating in extremely abrasive soils find that one or two passes of STOODY TUBE BORIUM, a tungsten carbide material, on tooth points give an amazing increase in service life—outlasting all ordinary alloys.

Your Stoody dealer will be glad to demonstrate the semi-automatic welder in your shop. Check the Yellow Pages in your phone book for his name and address or write for dealer's name and complete information to

STOODY COMPANY

11908 E. Slauson Avenue
Whittier, California

New Products

Joint Bond Test

A new joint extension machine for testing the strength of bonds formed by concrete pavement joint sealers is now available from Soiltest, Inc.

The new apparatus is a product control device designed for use by highway departments, airport authorities and testing laboratories. The machine is suggested for use in testing sealers of plastic and bituminous materials which are designed for pavement joint use. The design and operation of the joint-bond apparatus is said to be in accordance with federal specifications, corps of engineers re-



Soiltest Joint-Bond Tester
quires and with the procedure of
American Society for Testing Materi-
als D-1191-52T.

In the test, small cement mortar blocks 1 in. by 2 in. by 3 in. are bonded with the sealer. The operation of the testing machine simulates the expansion of a pavement joint. The cement blocks are pulled apart at the rate of $\frac{1}{8}$ in. per hr. Test specifications for sealers require that they must not elongate or lose bond past a certain number of inches. The testing machine may be run at temperatures as low as -20 deg. F.

Soiltest, Inc., 4711 W. North Ave., Chicago 39, Ill.

For more details circle 133 on
Enclosed Return Postal Card.

Debris Sweeper

A new 7 hp. machine for rapid removal of loose cement, dust, dirt and debris from pavement joints prior to resealing has been developed, by the G. H. Tennant Co.

The new joint-sweeper, Model JS sweeps joints $\frac{3}{4}$ in. to $2\frac{1}{4}$ ft. wide. It cleans regular joints or winding cracks to a maximum depth of $1\frac{1}{2}$ ft. The machine is chiefly used after joint-plowing, routing or scraping operations on highways, streets, or airports. It reportedly provides a clean,



Tennant Debris Sweeper
sharp surface, free of loose debris, for bonding properly with joint-sealing compounds, seals and fillers. Sweeping action is provided by a 24 gauge steel wire brush rotating at 1800 rpm. Brush bristles are tempered and twisted into tufts for stiffness. As the $9\frac{1}{2}$ in. brush revolves it throws loosened dirt, pebbles, and debris forward, away from the operator.

G. H. Tennant Company, 721 North Lilac Drive, Minneapolis 22, Minn.

For more details circle 134 on
Enclosed Return Postal Card.

Loader-Tractor-Backhoe

A new type loader-tractor-backhoe constructed as one completely integrated unit has been announced by Hy-Dynamic Co.

Known as the Dynaho, the unit has all the equipment fixed, not attachments. Featured are such items as:



Dynaho Combination
power steering, power shift forward and reverse and torque converter. Struck capacity of the backhoe is 7.5 cu. ft. and $\frac{1}{2}$ cu. yd. on the loader. Descriptive literature is available from the manufacturer.

Hy-Dynamic Co., Lake Bluff, Ill.

For more details circle 135 on
Enclosed Return Postal Card.

Paving Speed Increased

Development of a cyclone device which is reported to speed the laying of base courses for new highways and reduce contractor costs was announced by Delta Tank Mfg. Co.

The new unit, the Delta-Matic, drains the dry cement from the transport's high-speed discharge air streams. This involves spreading dry cement on the ground, mixing into the soil and adding water right on the planned course of new highways or runways. This will produce a stabilized bed which is later surfaced with bituminous



Delta's Delta-Matic

or concrete topping. This can eliminate the need for cement storage bins and dump trucks.

Delta Tank's Materials Handling Equipment Div., P.O. Box 1469, Baton Rouge, La.

For more details circle 136 on
Enclosed Return Postal Card.

Tankless Bituminous Sprayer

A new trilling tankless-type bituminous distributor has just been introduced by the Seaman Corp., Milwaukee.

The unit is towed by a bituminous supply truck from which the distributor draws its material. It can reportedly be towed from job to job at highway



Seaman's Bituminous Distributor

speeds. Extensions can be added to increase the length of the spray bar from its basic length of 12 ft. to a total of 24 ft. Nozzles are spaced 4 in. apart. A master-control valve operates all bituminous distributor functions.

Seaman Corp., P.O. Box 3025, Milwaukee 18, Wis.

For more details circle 137 on
Enclosed Return Postal Card.

Epoxy Products

Development of several epoxy products available from CIBA Products Corp. were recently announced.

Flexible epoxy resin, Aradite DP-437, is recommended as a modifier for conventional liquid epoxies to produce flexible systems. It can be mixed in all proportions, states the company, giving the user a range of cured properties. A curing agent for epoxy coating systems is available under the name of Araldite DP-121, which is reported to be curable 2-3 days after mixing with conventional liquid epoxy resins. Araldite 7072 is recommended for use in adhesive laminating and surface coating. It is reportedly designed to eliminate sintering and fusing during storage.

Ciba Products Corp., Fair Lawn, N.J.

For more details circle 138 on
Enclosed Return Postal Card.

Tournatractor

A new Model C Tournatractor with hydraulically operated attachments, as a companion unit to the current C Tournatractor with electrical controls, was announced by LeTourneau-Westinghouse.

The new machine will utilize a high pressure hydraulic system of 5,000 psi. Instead of the usual vane gear type, this unit is using a direct drive, Dynes pump. The new tractor is powered by a new GM 6V-71 engine, producing 218 hp. The transmission is the LW power-



L-W's Tournatractor Model C

shift type, air actuated with torque converter, 4 speed forward, and a top speed of 18.5 mph. The tractor was shortened 18 in. to an over-all length of 13 ft. 6 in., without the blade. The over-all width is 10 ft. 6 in.

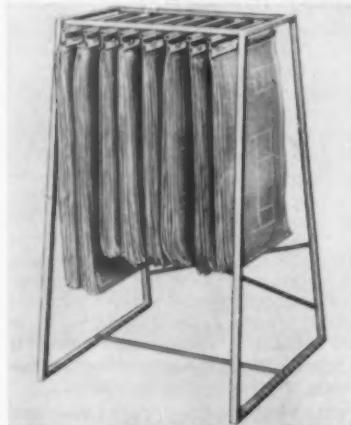
LeTourneau-Westinghouse Co., Peoria, Ill.

For more details circle 139 on Enclosed Return Postal Card.

Blue Print File

An all-steel glider for filing blue prints vertically has been announced by Momar Industries, Chicago.

Direct clamp-type plan holders, with "T" tops, glide in and out of rigid channel tracks. In filing position, plan holders are fully enclosed preventing the sag that often occurs. Three spaced thumbscrews on plan holders are loosened for insertions or withdrawals. Remaining plans are not disturbed under this system. This glider file is said to eliminate crimping, tearing or excessive wear.



Momar Glider File

sive wear. The system provides an organization of filing up to 1200 individual sheets.

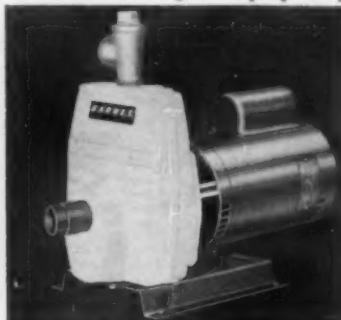
Momar Industries, 4176 W. Montrose

For more details circle 140 on Enclosed Return Postal Card.

Utility Pump

A new version of the Multi-Stage utility pump has been announced by Barnes Mfg. Co. The new pump is available in both electric and gasoline-powered models.

Construction of the new pumps make them desirable for general purpose ap-



Multi-Stage Pump

plications requiring high head performance. A large capacity is said to be possible since these power-packed Barnes pumps deliver up to 3200 gph. and have pressure up to 60 psi. New features include tri-color styling. Both pumps have a compact, heavy-duty close-coupled capacitor motor or engine, the former electric, the latter gasoline-driven.

Barnes Mfg. Co., Mansfield, Ohio

For more details circle 141 on Enclosed Return Postal Card.

Hose Coupling Machine

A new hose coupling machine for repair or replacement of hydraulic, gas,



MinIowa Coupling Machine

oil or water hoses using hydraulic power to swedge factory type ends on hose in 30 seconds has been announced by Manufacturers Association. Said to

eliminate many of the problems being encountered in procurement of such repair parts it may reduce breakdown time, and inventories.

An operator can repair broken hoses or make up new hoses with the MinIowa hose coupling machine and a small inventory of fittings. Hose maintenance shops and plants can service equipment which heretofore would require many thousands of dollars worth of parts inventory, states the manufacturer.

Manufacturers Association, Inc., Perry, Iowa

For more details circle 142 on Enclosed Return Postal Card.

Portable Heaters

Two new portable heaters for use in building and construction fields has been announced by John Wood Co.

Designated the PH 350 and PH 80, neither needs vents and are equipped with fold-back stainless steel combus-



Wood's Portable Heater

tion chambers to assure complete combustion and eliminate odor, smoke or visible flame. Capable of operating on kerosene, No. 1 or diesel fuel or fuel oil, both units are equipped with a clean shut off 3 way valve. The model 350 has an output of 350,000 btu. per hr. and is designed for heavy duty work. The model 80 delivers 80,000 btu. per hr. for 20 hr. on one fuel tank.

John Wood Co., Conshohocken, Pa.

For more details circle 143 on Enclosed Return Postal Card.

Lighting Unit Panels

Opalescent fiberglass panels designed for use with octagonal lantern, decorative post luminaires and fluorescent traffic lighting units are now being marketed by Plastic Age Mfg. Co.

Reportedly used in Chicago and Los Angeles, the product is created of fiberglass mat combined with a modified light stable synthetic resin and are said to resist BBs and rocks. Standard thickness is approximately .100 in. but other thicknesses can be furnished, the company states, where customer requirements warrant.

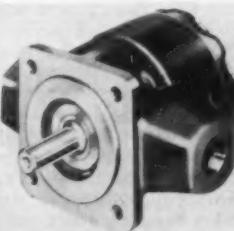
Commercial Products Div., Plastic Age Mfg. Co., 14300 Davenport Rd., Mint Canyon, Calif.

For more details circle 144 on Enclosed Return Postal Card.

Dual-Vane Pumps

A new series of single and double Dual-Vane pumps, incorporating full bearing cam rings and port plates, has been developed for fluid power systems by the Hydrex Div. of the New York Air Brake Co.

Designated the PF 100 Series, the new pump features complete cartridge construction. The units are able to be



Hydrex Dual-Vane Pump

serviced in a short time because all pumping parts are contained in an easy to install cartridge. All models are internally drained, requiring no external connections. The pumps, which may be driven by a flexible coupling, gear chain or belt, are designed for industrial as well as mobile equipment applications.

Hydrex, 9000 E. Michigan Ave., Kalamazoo, Mich.

For more details circle 145 on Enclosed Return Postal Card.

Asphalt Finisher

Model SA-40 crawler mounted asphalt finisher, the fifth model in a finisher line was announced by Barber-Greene Co.

Reportedly designed to lay any sort of asphalt surface in widths from 8 to 14 ft., the new model is capable of laying speeds in the 100 ft. per minute range and also possesses high travel speed capacity. Among its features are: hydraulically raised hopper side; oscillating pivoted truck contact roller; automatically controlled twin feeders with manual override controls; and hopper gates crank controlled from the screed platform for ease in adjustment. The complete power train and other internal machinery are housed by access doors, giving clean appearance and guarding clutches, transmissions from the weather.

Barber-Green, 400 N. Highland Ave., Aurora, Ill.

For more details circle 146 on Enclosed Return Postal Card.

Truck Bodies

The production of a newly designed 25 Powers-American services and maintenance body for general service work was announced by McCabe-Powers.

According to the company, this body is so planned that with a slight rearrangement and/or removal of shelves and bins it can be made to meet the requirements of many utilities. Series

25 Bodies are available in sizes for old or new chassis and the go in. is for 3/4 ton chassis.

Standard construction features include: non-binding nylon door bush-



McCabe-Powers Bodies

ings; fully-enclosed, steel wheelhouseings that protect compartment walls from road debris; corrugated steel cargo area floor; reinforced doors with recessed, key-locking latches; safety catches on all doors; and rigidly ribbed head panel.

McCabe-Powers Body Company, 5900 North Broadway, St. Louis 15, Mo.

For more details circle 147 on Enclosed Return Postal Card.

Midget Vibrator

A light weight small head midget vibrator with a motor reported capable of holding up under continuous use was announced by Stow Mfg. Co.

The new vibrator is powered by a lightweight universal 1 hp. motor. Available with either $\frac{7}{8}$ in., $\frac{1}{4}$ in., $\frac{1}{2}$ in. or 2 in. heads, all vibrator heads have duplex ball bearings at each end supporting the eccentric weight and

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MONARCH

power hydraulic controls
lift and lower snow plows automatically!

Be sure your equipment is equipped with Monarch units — makes snow removal jobs faster, easier, more economical. One man controls the plow right from the cab . . . instant up-and-down action with the flick of a wrist. A Monarch control can be quickly installed. See your dealer. Send for free folder today.



MONARCH ROAD MACHINERY COMPANY
1331 Michigan St., N.E. Grand Rapids 3, Michigan, U.S.A.

... for more details circle 304 on enclosed return postal card

ROADS AND STREETS, December, 1960

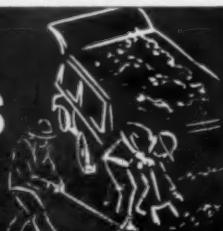
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WEATHER IS
HARD ON ROADS

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For information regarding your nearest producer or franchise areas available — write to

KOTAL
Company

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... for more details circle 297 on enclosed return postal card

are sealed to retain the oil lubricant for life. Flexible shafts are available in lengths of 2 ft. to 21 ft. The EU is especially suited for jobs where narrow forms are used, where reinforcement is closely spaced, and vibrating slabs, such as on a multi-level parking lot.

Stow Mfg. Co., 65 Shear St., Binghamton, N.Y.

For more details circle 148 on
Enclosed Return Postal Card.

Ten Inch Saw



Skil's 10 in. Saw

A new 10 in. saw has been announced by Skil Corp..

Loosens
Handy
Won't
Leak
Shoots
3 Feet

**FROZEN
PARTS
FAST!**

KANO Aerokroil

Same formula as famous Kroil that has pleased 14,000 industrial users for 10 years or more. Loosens stuck together metal parts, bushings, bearings, bolts, screws, pipe, etc., "anything from an embalmer's needle to a bulldozer," one customer said. "Like an extra employee," said another. "Turned rust into mush, put \$30,000 equipment back to work."

You too can get these results. Try Aerokroil at our risk. Send \$2 cash, and we'll pay postage.

KANO LABS, 1061 Thompson Lane, Nashville 11, Tenn.

... for more details circle 299 on enclosed return postal card

126

Chicago. The high speed, top handle model 860 saw weighs 17½ lb and will cut 3¾ in. stock at 90 deg., up to 21½ in. stock at 45 deg.

An exclusive feature of the saw is floating guards. As cutting depth decreases, the upper guard automatically rotates forward and the lower guard rotates back. This means that even on extremely shallow depth settings, the blade is always covered. A "Vari-Torque" clutch protects against kick-back and damage.

Skil Corp., 5033 Elston Ave., Chicago 30, Ill.

For more details circle 149 on
Enclosed Return Postal Card.

Lighting Control

The Lamplighter, a new photoelectric lighting control, is being made produced by the Acme Wire Co.

The compactly designed control has an injection molded plastic cover and base to provide high dielectric strength. A series of exterior ridges makes handling easier and facilitates installation, while a twist-lock base fits all standard



Lamplighter Control

receptacles. Although a non-fused model is available, Lamplighter offers fuse protection in case of overloading. Protection against surges from both the line and the load is provided; in addition, the components are protected against lesser surges by a rare gas lighting arrester built into the Series 15,000 control.

Acme Wire Co., Utility Products Div., New Haven 14, Conn.

For more details circle 150 on
Enclosed Return Postal Card.

Hose Clamp

The development of a new clamp for hose has been completed and is now being marketed by the Marman Div. of Aeroquip Corp.

The new clamp has no perforations through the band to cause extrusion or scuffing of rubber. The steel screw engages on coined threads. Made to prevent snapping open or jogging loose, the clamp can be removed easily if required, reports the maker. It is also reported to provide uniform clamping pressure and will not distort thin wall tubing. Wide diameter adjustment is possible because of high strength band.

Aeroquip Corp., 11214 Exposition Blvd., Los Angeles 64, Calif.

For more details circle 151 on
Enclosed Return Postal Card.

Thin Gauge Flashing

Development of a thin-gauge flexible sheet for elastic through-wall flashing and membrane waterproofing has been announced by Dow Chemical Co.

The new material, called Saraloy 400, is recommended for most waterproofing and flashing applications that do not involve direct sunlight. The new material is described by Dow as a tough and flexible sheet finely embossed on one side to provide mechanical keying action in metal joints, self-extinguishing, corrosion resistant and easy to paint. Descriptive literature is available from the manufacturer.

Building Products Sales, Dow Chemical Co., Midland, Mich.

For more details circle 153 on Enclosed Return Postal Card.

Electric Brakes

A unique electrical braking device for trucks, trailers and commercial vehicles will be manufactured by Lear, Inc. on an exclusive grant from Telma of Paris.

Entitled the Retarder, it has been successfully used in France for 10 yrs. Inserted in the drive shaft, permanently geared to the rear wheels, the retarder requires only the battery for excitation. The vehicle's own energy is used to retard its motion. Standard retarder models cover vehicles with maximum loads of up to 35 tons and low current absorption rates. They are available in four models for 6, 11, 20 and 35 ton vehicles.

Lear Electro-Mechanical Div., 110 Ionia Ave., Grand Rapids 2, Mich.

For more details circle 154 on Enclosed Return Postal Card.

Estimator's Construction/Manhour Manual

An accurate and convenient method of estimating direct labor for complete construction work in any given system or location is given in a new book by Gulf Publishing Co.

Written by John S. Page, it lists many manhour tables with easy to read listings. The manual points out how to arrive at composite rates using productivity, efficiency and production elements. Subjects covered in the 17 sections include: demolition; site grading and structural excavation; concrete roadways; and structural steel.

Gulf Publishing Co., P.O. Box 2608, Houston 1, Texas

For more details circle 155 on Enclosed Return Postal Card.

Structural Radio Tower

A complete line of radio towers and accessories is available from KTV Tower and Communication Co. Reported to afford free-standing up to 50 ft., the towers are engineered to stand safely in

winds up to 80 mph. without guy wires. The lack of bolt holes in the structural frame is reputed to avoid rust, ripping or other weakness. Trapped moisture is dispensed with by drainage joints and the whole tower is electro-plated with durable zinc for permanent high-lustre finish. The construction is such that service climbing is feasible.

KTV Tower & Communication Co., P.O. Box 294, Sullivan, Ill.

For more details circle 156 on Enclosed Return Postal Card.

Defrost De-Icer

A new automotive chemical packaged in a 16 oz. size spray can melts frost

and ice on car windshields, lights, locks and windows, prevents inside glass fogging and keeps ice from forming for hours.

Called "Prestone" Spray De-Icer AS-241, it is the newest member of the growing family of "Prestone" ice fighters. The new De-Icer has a powerful propellant system that shoots a strong spray of de-icer at temperatures ranging down below 0 deg. F. The de-icer can be sprayed accurately on the windshield from three to four feet away. It is reported harmless to car finishes.

Union Carbide Consumer Products, 270 Park Avenue, New York, N.Y.

For more details circle 157 on Enclosed Return Postal Card.

New SPEEDLINE ROAD PLANNER

Automatic "Traverse Leveling Action" spreads sub-base materials to uniform thickness without segregation or corrugation. Patented "Spring Equalization" exclusive with Speedline. Approved by Engineers and Contractors for road building. Also ideal for leveling parking lots, air field strips, housing areas, farmlands.

For the finishing touch
Look to SPEEDLINE

Write for details:



Model C 126 DI Scrape-A-Plane

SPEEDLINE IMPLEMENT MFG. CO. Las Cruces, New Mexico

... for more details circle 311 on enclosed return postal card



**500
TONS
OF
CASTINGS
DAILY!**



With the recent opening of plant #2, shown above, our production potential of Gray and Ductile Iron Construction and Industrial Castings has now reached a maximum of 500 tons daily. This capacity, plus 15,000 patterns, plus a good on-hand supply of standard castings, plus 90 years experience in the business, is your assurance of prompt delivery, superior quality, complete uniformity and practical economy.

* * *

New and fully illustrated 168-page catalog of construction castings will be sent promptly upon request.

**NEENAH FOUNDRY COMPANY
NEENAH • WISCONSIN**

Chicago Office: 5445 North Neva Avenue, Chicago 31, Illinois

... for more details circle 307 on enclosed return postal card

Manufacturers' Literature

CENTRIFUGE KEROSENE: A bulletin describing the apparatus and procedure for determining the surface capacities of aggregates used in bituminous mixtures by means of centrifuge kerosene equivalent (CKE) test has been published by Soiltess Inc., 4711 W. North Ave., Chicago 39, Ill.

The test determines the absorption capacities of both coarse and fine aggregates by measuring the amount of kerosene absorbed by samples of the test material in centrifuge. The test also provides a measure of the relative particle roughness or degree of porosity of the test materials.

For more details circle 160 on Enclosed Return Postal Card.

OPERATOR'S PUBLICATION: The forgotten man of the construction industry now has his own publication. Published and distributed by a group of Caterpillar dealers, the new magazine is aptly entitled THE OPERATOR. Illustrated, the new magazine contains 16 pg. of operating aids, job stories, "how-to" tips, maintenance tips and humor. First issue of the every-month publication was mailed September; copies may be received by contacting the local Caterpillar dealer.

For more details circle 161 on Enclosed Return Postal Card.

MAGAZINE: The country's most precious natural resource is water, yet many areas of the country are beginning to feel the pinch of water shortages. The feature article in the current issue of PRODUCTION ROAD, external mag-

azine of Twin Disc Clutch Co., Racine, Wis., examines the reasons for these shortages and spells out the measures needed to assure adequate supplies throughout the nation. A tank-mounted hydraulic unit used by the Armed Forces to cross impassable gullies and streams is also described.

For more details circle 162 on Enclosed Return Postal Card.

LIGHTING CATALOGS: Two new catalogs on lighting standards and equipment, "Octagonal Tapered Steel and Aluminum" and "Aluminum Round Tapered", are being offered by Kerrigan Iron Works Co., P.O. Box 479, Nashville 2, Tenn.

Included in these two catalogs are new designs in both street and area lighting standard equipment with a variety of arms to meet most of any lighting problem. Traffic signal standards and brackets and mast arms for wood, metal pole and wall mounting are included in the Round Aluminum catalog.

For more details circle 163 on Enclosed Return Postal Card.

ROCK DRILL: A bulletin descriptive of its new Silver Bullet rock drill is announced by Davey Compressor Co., Kent, Ohio.

Said to be an excellent all purpose tool, the drill is in the medium-weight 55 lb. class. Bulletin contents include a listing of features such as 3-way throttle control and automatic lubrication, as well as complete specifications.

For more details circle 164 on Enclosed Return Postal Card.

Guidebook Slide Rule Helps Plan Profitable Retooling

Job studies show that portable power tools may be producing only 60 percent of rated output according to a new 28 pg. report published by Ingersoll-Rand Co., 11 Broadway, New York 4, N.Y.

The publication shows how a planned annual retooling program can increase output of scaling, backfill tamping, rock drilling and similar construction operations. The guidebook offers basic formulas for computing the dividend on payroll dollars possible by planned annual retooling. A simplified example: a particular operator uses a power tool an average of 4 hr. or 50 percent of each 8 hr. working day. If his total pay is \$5000 per yr., labor cost for operating the tool in question is \$2500 per yr. If the tool is only 50 percent efficient, the annual loss in hr. pay is \$1250. By replacing this inefficient tool with one operating at 100 percent efficiency a \$1250 annual dividend on payroll dollars can be realized on one operator's wages alone! Subtracting the cost of the new tool gives the new dividend on payroll dollars. The Ingersoll-Rand publication records reasonable and profitable annual retooling rates as confirmed by field experience. Confirmed profitable rates range from 5 percent annual retooling rates for air hoists to 50 percent for chippers, scalers and riveters. The typical figures for tool costs, pay rates, numbers of workmen and other data are provided for the Ingersoll-Rand formulas. Work space is also provided to make your own computations.

A companion piece to the guidebook is a handy glide rule computer for rapid calculation of your gross dividend on payroll dollars.

For more details circle 165 on Enclosed Return Postal Card.

Continued on page 140

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Drag Broom Levelers
Street Push-Concrete

KENNEDY'S Brooms

VAN BRUSH MFG. CO. INC.

2725 McGee Hwy. Kansas City, Mo.

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"Construction superintendent wishes to hear from American firm interested in locating northern Canadian territory, either through direct representation or by acquisition of construction firm with all late model equipment presently engaged in highway construction. Principals only please. Address reply Mr. Gibson, 347 West 4th Street, North Vancouver, B. C."

RENTAL PURCHASE

BAY CITY 20-ton Motor Crane, T 50 carrier, 50' boom, Jib, used 1,430 hours, excellent, \$800 month. \$17,000, yard.

EUCLID Twin Power Motorscraper, 18-24 cy., two 190 hp. GM diesels, torque converters, just factory rebuilt. \$1850 mo. \$18,000.

MICHIGAN 175AD Loaders, \$9,500.00.

PIONEER 3240 Jaw Portable Primary, including 12' feeder, 30' conveyor, grizzly, power, mounted Athey crawler tracks, U. S. Gov't surplus, new 1952, never used. Less one-half replacement cost, \$35,000.

QUICKWAY 125A Backhoe, new 1956, 6/10 cy., on 4-ton 6x6 carrier. Excellent. \$400 mo. \$6000.

QUICKWAY L Backhoe on 4-ton 6x6 carrier, 4/10 cy., very good. \$300 mo. \$2500.

BANTAM T35 Backhoe on Bantam 200 Motorcrane Carrier, gooseneck boom, good. \$450 mo. \$6750.

TAMPO SP9 Pneumatic tired Roller, Self Propelled, excellent. \$350 mo. \$3250.

GALION 5-8 ton Tandem roller, new 1954, excellent. \$350 mo. \$3500.

BUFFALO SPRINGFIELD 8-12-ton Tandem Roller, KT19A8, New 1957. \$475 mo. \$5500.

CLEAVER BROOKS 3-Car Heater, portable, excellent. \$1350.

DEARBORN AUGUR on Ford Tractor, good. \$600.

WRECKING BALLS, 6000 lbs. new, pear shaped. \$350.

(2) **AMERICAN** 2-Drum Hoists with 40 hp. gasoline engines, excellent. \$750 each.

ARPS TRENCH HOG, like new, on late model. For tractor. \$300 mo. \$2350.

CRANE 20-ton Lo-Boy Trailer, tandem, new. \$350 mo. \$3000.

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MAYfair 1-1710

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80-D Northwest 2½ yd. Shovel, 1956.
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COMPANY**

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 INSLEY Model K-12, powered by Chrysler Industrial Engine. Shovel Front and Crane Boom available. Rebuilt.
 INSLEY Model K-10 Backhoe, powered by Buda Gas Engine. Shovel Front and Crane Boom available. Good condition.
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 LE BOI 105 CFM—Power—Le Boi—Gas Engine—mounted on two (2) pneumatic tires. Good condition.
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 DAVEY 125 CFM—Power Hercules Gas Engine—mounted on two (2) pneumatic tires. Rebuilt.
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One—Warner-Swasey Model 2460 Gradall with IHC UD-350 Diesel engine, 4-ft. extension and 3-ft. digging bucket, Mounted on Duplex 6 x 4 factory carrier with gasoline engine. Machine has been completely overhauled and both engines rebuilt \$19,900

One—Warner-Swasey Model 2460 Gradall with GM 4-71 engine with 4-ft. extension and 3-ft. digging bucket. Mounted on Duplex 6x6 (Front Wheel Drive) with gasoline engine. Machine has been completely overhauled and is in very good condition \$21,000

Ten—Kenworth End Dumps Model 820. 15 yard capacity rock beds, 200 h.p. Cummins engines, air clutch, power steering, new tires. All have been inspected and put in excellent condition \$16,500

Three—Euclid Model 86FD, with 200 h.p. Cummins engines, 15-yd. capacity end dump rock beds, near-new tires. Trucks are in very good shape \$14,500

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NAME ADDRESS

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 - 4—Barber-Greene Finishers 879A.
 - 1—Caterpillar Motor Graders, Cat 12, 7T-416 and 8T-19144.
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REF. No.	CRAWLER DOZERS	PRICE
1078	ALLIS-CHALMERS Model HD-5B Tractor Doser, S/N 17142; GM 2-71 diesel engine, hyd. straight dozer blade, 16' grouzers	\$3,500
1103	ALLIS-CHALMERS Model HD-5B Tractor Doser, S/N 28510; diesel engine, hyd. straight dozer blade, 17' 6"	\$7,000
1109	ALLIS-CHALMERS Model HD-5B Tractor Doser, S/N 28558; GM 2-71 diesel engine, 16' straight dozer blade Model HD-5B, S/N 271; 18' track	\$8,000
1068	ALLIS-CHALMERS Model HD-15A Tractor Doser, S/N 50; GM 6-71 diesel engine, Baker Model 15B straight hyd. dozer blade, S/N 121; 20' grouzers	\$13,000
896	ALLIS-CHALMERS Model HD-16AC Tractor Doser: Crawler Doser, S/N 703, A-C Diesel; hyd. torque converter, cable straight dozer blade Model CT164 w/pusher plate, Model 75 PCU, 22' grouzers	\$17,500
1079	ALLIS-CHALMERS Model HD-5G Crawler Loader, S/N 17915, GM 2-71 diesel engine, 1/4 cu. yd. Hyd. loader Model TS-5, 15' semi-grouzers	\$7,750
884	ALLIS-CHALMERS Model HD-5G Tractor Loader, S/N 2746, GM 2-71 diesel engine, hour-meter, 1/4 cu. yd. hyd. loader TS-5, 15' semi-grouzers	\$5,500
1080	CATERPILLAR Model 934 Tractor Loader, S/N 11-A-2425, Cat diesel engine with electric starting, 1/4 cu. yd. hyd. bucket, oil clutch, 15' semi-grouzers	\$8,900
1053	ALLIS-CHALMERS Model HDG Crawler Loader, S/N 10577, A-C diesel engine Model HD-344, Model TS-5, 15' semi-grouzers, A-bucket, 9' 6" lift	\$4,000
1123	ALLIS-CHALMERS Model HD-5G Tractor Loader, S/N 1432, 1/4 cu. yd. A-C diesel engine, Model HD-344 S/N 80067, Tractomatic Model TS-6 1 1/4 cu. yd. two-position Loader S/N 943	\$8,500
1126	CATERPILLAR Model 935 Crawler Loader, S/N 12-A-4193, 1/4 cu. yd. Cat D-316 diesel engine, 6-volt electric starter, oil clutch, front pull hook, tip back bucket 1/4 cu. yd., 15' semi-grouzers	\$24,000
	MOTOR SCRAPERS	
581	LATOURNEAU-WESTINGHOUSE Model C Tournapull, S/N GP-40297 CPFH, powered with GM 6-71 engine; Lucite windshield: 34-00 x 22, 34 ply Ground Grip tires, Model C Scraper S/N 8-6020 CM-B with 24-00 x 22, 34 ply Nylon tires, sideboards	\$16,000
707	LATOURNEAU-WESTINGHOUSE Model C Tournapull, S/N GP-40298 CPFH, powered with GM 6-71 engine, Lucite windshield, 24-00 x 22, 34 ply tires; Model C Scraper, S/N 8-00064 CM with 24-00 x 22, 34 ply tires, sideboards	\$17,000
	CRANES AND SHOVELS	
912	LIMA Truck Crane Model 84-T, S/N 32025; 1 1/2-ton cap. mounted on 300/450 Dart crane carrier. Waukesha gas engine in crane carrier, electric power steering, GM 8-71 diesel engine, high speed worm driven boom hoist, standard back hitch gauge, 25' boom, 18' insert	\$10,000
906	P&H Model 855-B Crawler Shovel, S/N 13179, powered by GM 8-71 diesel engine, chain crawler shovel with power boom hoist, 2 cu. yd. bucket	\$24,000
	COMPACTOR	
1079	BUFFALO-SPRINGFIELD Model K-16 Komptor, S/N 30125, powered by Cummins Model JV-6-BL diesel engine with torque converter	\$18,500

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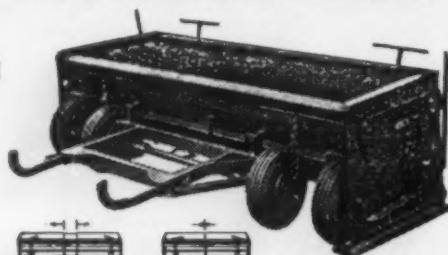
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 1—1957 White Mustang Tractor Truck. Sleeper Cab, Good Condition...\$2,950
 1—International TD-24 Dozer, Completely overhauled & reconditioned. Like New\$8,000
 1—1955 Chev. 2 ton Mobil Trailer Hauler. Good condition\$1,250

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- 10—1955 & 1955 R.D. 205 Internationals with J. T. Cummins Engines with Tag Axles.
 4—1954 R.F. 195 Tandems 175" wheel base with 8 to 10 yard dump bodies.

A. J. RHIAN
 International Truck Dealer
 Phone NO 5-2527
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2½ yd.	NORTHWEST 95 DRAGLINE—Good condition, new in 1950. Located Pennsylvania	#13222
1 yd.	MARION 43-M SHOVEL—Good 1956 model, Cat engine. Located Ohio	#21456
3 yd.	P & H 1055 SHOVEL—Good 1946 model, extra features. Located Illinois	#10475
¾ yd.	MARION 32-M DRAGLINE—Good 1955 model, Gas powered. Located Ohio	#21369
2½ yd.	P & H 955-A SHOVEL—Very good 1951 model, extra engine. Located Arizona	#14944
1½ yd.	MARION 362 DRAGLINE—Excellent 1959 model, 2 yd. bucket, 60 ft. boom. Located Florida.	#22107
2½ yd.	F & H 855 DRAGLINE—Good 1946 model, 75 ft. boom, extras. Located Pennsylvania	#7957
¾ yd.	MARION 35-M DRAG-CLAM—Excellent 1958 model with extras. Located Arkansas	#21939
¾ yd.	MARION 35-M SHOVEL—Good 1958 model, located in Kansas	#21812
4 yd.	MANITOWOC 4500 SHOVEL—Good 1955 model, 60 ft. boom. Located Ohio	#4631
3½ yd.	LIMA 1201 DRAGLINE—Good 1955 model, 100 ft. boom. Located Louisiana	#329027
1 yd.	MARION 43-M DRAG-CLAM—Good 1951 model, 60 ft. boom. Located Indiana	#9426
1½ yd.	MARION 362 SHOVEL—Good 1953 model, 23 ft. boom. Located Indiana	#9892



POWER SHOVEL COMPANY
 MARION, OHIO

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 PHONE 2-1151

FOR SALE**Barber-Greene Asphalt Plant 90-100 TPH**

848 Mixer, engine driven, converted from Model 98-1 in '53.
 835 Dryer, 5' x 20', 30 HP Elec. Motor, Low pressure burner, new in '53.
 852 Collector, 4 Cyclone Clarage Fan, 20 HP Motor, new in '53.
 811 Fines Feeder, new in '53.
 Madsen Wet Washer, new in '53.

PRICED **\$16,500.00**

Contact: FARLEY EQUIPMENT CO.

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2 Ford Snow Blowers
MARMON HARRINGTON
4 WHEEL DRIVE
 Blower Powered by
 Buda Engine
 Price \$6,500 Each



These machines are unused and like new. They are repossessed, painted orange and ready for work.

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 Keesville, New York
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LOCATED IN TEX., ARK. & ARIZ.

PULL SHOVEL: Northwest 80-D
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 DRAGLINES: Insley K-12 & Model L
 TRACTORS: TD9, TD14, D6, D7, D8, HD9C
 SCRAPERS: A-C TS160, TS200
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 DITCHERS: Parsons 77, 88.

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CLEARING HOUSE SECTION

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COMPLETE PORTABLE CRUSHING UNIT

AVERAGE AGE: 3 YEARS

CONSISTS OF THE FOLLOWING ITEMS:

- (1) 3' Symons Nordberg cone w/Roots Vane standard type blower w/3 H.P. motor, 125 H.P. A.C. electric motor. 4x12 Cedar Rapids doubledeck vibrating screen w/15 H.P. electric motor. 24' x 36" conveyor w/H.P. motor. With oil compensator starter. Above mounted on heavy duty tandem trailer.
- (2) 22 x 36 jaw crusher w/100 H.P. electric motor w/oil compensator starter. 30' of 30" conveyor w/7½ H.P. gear head elec. motor mounted on H.D. tandem trailer.
- (3) 40 x 24 Cedar Rapids Rolls w/100 H.P. electric motor w/oil compensator starter.
- (4) 4 x 12 double-deck Cedar Rapids screen, 15 H.P. electric motor. 25' of 30" conveyor w/7½ H.P. electric motor w/Dodge shaft mounted drive. Mounted on H.D. Tandem Trailer.
- (5) Caterpillar D-397 diesel generator, carbon pile regulator. Complete with all necessary electrical wiring.
- (6) 1946 Chevrolet van truck with miscellaneous switch boxes, etc., plus numerous other incidentals.

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Used Equipment as listed, all in good to very good condition; priced to sell:

120 yd. Johnson semi-automatic concrete batch plant; five compartments (one cement)-bulk cement under track truck loader—100 Bbl. bulk cement tank trailer—35,000 sq. ft. Ariss (Irvington) steel speed forms; and 3,000 sq. ft. Economy steel forms for concrete walls—L-41 Lorain crawler crane, 1948, SN 18554—Northwest 95 crawler crane, SN 12527—P & H crawler crane, model 855 LC, diesel, SN 10572, 1946—P & H crawler crane 855-D, SN 10984 (Lorain and P & H cranes have shovel front and backhoe attachments)—Kwik-Steam generator, Littleford, model 3600-C-3 TD-24 bulldozers, SN 1914, 2024, 4266—2 Chaser 5' diam. dual tandem sheepfoot rollers—Feets 34E paver, SN 49211—Multi-Feets 34E paver, SN 48021—10 ton, 3 wheel Huber roller, SN 10821—Rome Disc plowing harrow, model TMR 24-30—2 315 Schramm portable air compressors—2 Moretrench well-point pumps complete with 600' pipe main—120 ton Blaw-Knox concrete aggregate weigh bins.

Write P. O. Box 402, Barre, Vermont

FOR SALE

- (5) Euclid 13 yd. bottom dumps.
- (4) Euclid 6 wheeler 14TDT rubber tired 15.5 cu. yd. scrapers.
- (5) Rebuilt TS-24 Euclid twin engine rubber tired scrapers.
- (1) Mod. TC-12 Euclid crawler tractor with dozer, used 5 months, rebuilt.
- (1) Mod. TC-12 Euclid twin engine crawler tractor with pushblade, rebuilt.
- (2) Rebuilt TS-24 Euclid twin engine, rubber tired scrapers, used five months, located in Memphis.

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USED TIRES

1100x20	\$32.50
1200x20 16 ply	37.50
1300x24 Grader 6 ply	42.50
1300x24 Grader 8 ply	47.50
1400x20	42.50
1400x20 Grader	54.50
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All Tires are Original Tread
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700x15 6 ply Tires	24.82
825x20 10 ply All Duty Tires	57.47

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We will issue credit on long distance calls when purchases are completed.
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Made in Japan SPUR GEAR CHAIN HOIST SPECIAL



1/2-Ton	\$15.00
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1-Ton	\$65.00
1 1/2-Ton	\$85.00
2-Ton	\$95.00
3-Ton	\$121.00
5-Ton	\$225.00
8-Ton	\$320.00
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Also available, Coffin type pull-lift hoist, 10-ton.

DEALER INQUIRIES INVITED (6 Units or More)

ORDER NOW. Your check must accompany order unless you have satisfactory D&B Rating.

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3000 Watt AC Generating Set

Engine Model ZXB Hercules, 4 Cylinder Water cooled with 6 volt Starter, Hobart Generator, 115 Volt, 60 Cycle, 1200 RPM. Completely Hooded with panel board. All diam. 53" long, 25½" Wide, 31½" High. Shipping weight 791 lbs.

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EXCAVATING EQUIPMENT

- 4—DB's, cable & hyd. blade, 8R series.
- 4—Motor Scrapers, TS 300's.
- 1—Dozer HD-19.
- 1—Dozer D-7.
- 1—Dozer D-4.
- 1—Hough Payloader HF.
- 1—Compressor, 315, CF gas.
- 2—Compressors, 105 CF, truck mtd.
- 1—Bay City, Model 20, Crane.

All of the above equipment is in good operating condition.

WOODCLIFF EQUIPMENT COMPANY
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Steel Frame ¾ Plywood Skin 4 & 5 Foot Square Mfg. by Blaw Knox—½ original cost.

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1—2 DW 21 Cats w/#21 scrapers ser.	\$18,500.00
#8 W1317 & SW 1339. Excellent including rubber-wide heads, rebuilt	Each \$18,500.00
2—2 DW 21 Cats w/#470 scrapers series 580	Each 25,000.00
3—3 WID 60 Koehring Dumpsters serial #1228, 2882, & 4378	Each 5,500.00
All	15,000.00
4—D-8 Cat. series 15A push plate only, excellent	16,000.00
5—DW 10 Cat. ser. #IV1514 w/#10 pan, good	6,500.00
excellent	7,500.00
6—Eagle twin screw Low Washer, 7' x 10'	5,500.00
7—Cat. #12 M.G. ser. #ST19025 oil clutch, excellent	6,000.00
8—Cat. 50 pan ser. #SC 2155, large tire group	3,000.00
9—LeTourneau L-S pan ser. #S22343 LS-P 1600x20 rubber	7,500.00
10—Blaw Knox widener model 95, excellent	4,750.00
11—Galon 20' Trench Roller, near new	11,500.00
12—2 Galon Chief Rollers, excellent, Price on request	16,000.00
13—2 Barber-Greene \$10 Asphalt Plants 25 to 30 tons per hour. Your choice	1,250.00
14—3 LeTourneau Bulk Dump Model 25FTL ser. #2738 with 58W wagon, Cummins engine	5,000.00
15—2 Cat. 7A Blades complete	1,350.00
16—Fleco 10 tooth root rake for Cat. 7A. Like new	850.00
17—#25 Cat. C. C. for D-6	1,000.00
18—#25 Cat. C. C. for D-8	900.00
19—Hyster D4N Winch	
20—Cat. 68 Blade w/#24 C. C. complete	

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FOR SALE**2 Highway - 100 Barrel
BULK CEMENT TRAILERS**

Tandems, Air Brakes, 10:00 x 20 Tires, Good condition throughout. Unloading Auger powered by 1HP Electric Single Phase A.C. Motor. 110/220 volts. Each \$1,250

2 - LeTourneau F. P. Scrapers
18:00x24 Tires, Dual Rears. Choice ea. \$2,750
1 - LeTourneau L. P. Scraper
18:00x24 Tires, Good Condition \$2,750

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1956 Model W2209 Four Wheel Drive 1400x24 Tires. 300 Cummings Diesel Engine 6 Yard Dump Body. 15 Ft. Plow with Hydraulic setup for side plow. Ran 7000 miles. Air Force Govt. Sup. Cost \$48,000. Will sell for \$12,000.

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#11LBY-105Wx

Machines in average operating condition, are equipped with 400 HP Hall-Scott Butane engines. Have 27x33-30 ply tires with about 30% wear left. All located in Waddington, N.Y. BUY FOR 10% OF NEW MACHINE OR \$7,500.00 EACH.

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AVAILABLE NOW, LOW COST POWER & PRODUCTION

CEDARAPIDS TRI-TANDEM PORTABLE CRUSHING PLANT, w/ 18x30 jaws, & 6x30 jaws, 30 x 18 rolls, 42 in. x 10 ft.—2½ deck screen, 30 in. x 40 ft. field conveyor, Cat D 337 Power, mtd. on 10:00x20 tires, w/ air brakes.

CEDARAPIDS 30x22 SECONDARY ROLL CRUSHING PLANT, 3022 rolls, 3x8' 2-deck screen, 30" feed conveyor, elevating wheel return, 30 in. front delivery conveyor, 24" return conveyor, 8:25x20 tires w/ dolly, V-belt drives, less power.

PORTABLE CRUSHING PLANT, 15x36 jaws, 24x16 rolls, 4'x10' DD screens, 24"x4' reciprocating feeder, 24" under crusher conveyor and return conveyor, side discharge, International UD-18 diesel power MTD on 10:00x20 tires w/dolly.

ROCK DRILL PORTABLE w/ TWO CLEVELAND ROCK DRILLS for vertical or horizontal drilling, w/ 600 cu. ft. LeRoi Compressor mtd. on International TD-24 crawler tractor.

P&H MODEL 255 ¾ YD. CAPACITY CRAWLER MTD. DRAGLINE, CLAM SHELL CRANE, w/ Owen Clam Shell bucket, 40' boom, powered w/ Waukesha 6 cyl. gas engine.

LORAIN MODEL L-50 1 yd. capacity, crawler mounted shovel, S.N. 24782, powered with Caterpillar D-318 Diesel Engine, 30" wide track shoes, 11' long tracks, w/ heavy counterweight.

LE TOURNEAU MODEL C SCRAPER, 18:00x25 drive tires, 21:00x25 rear tires, w/ Cummins Diesel.

ADAMS MACHINERY, INC.

2016 W. CORNELL, MILWAUKEE, WIS.—HI ITop 4-7400
EAU CLAIRE—TEmple 2-2895 GREEN BAY—HEmlock 7-8791

NEW GOVERNMENT SURPLUS**LIMA MODEL 34**

3/4 YARD - CAMBERED - COMPLETE

BACKHOE ATTACHMENTS

NEW! \$2600⁰⁰ NEW!

THE U. S. TRUCK & EQUIPMENT CO.

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USED TIRES-NO REPAIRS

26.5 x 25—16 Ply Nylon	\$385.00
23.5 x 25—16 " "	315.00
1400 x 20—20 " Scraper	95.00
1400 x 20—12 " Grader New	135.00
1300 x 28—8 " 90% Trd..	85.00
750 x 15—20 " Nylon Acft.	25.00
700 x 16—12 " " Ideal for Front End Loader	25.00
All Sizes Aircraft Tires	

KTV **TOWERS**

are SAFE in winds up to 80 m.p.h.
faster installation . . . much longer life.

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We also have heavier towers available for Communication work.

SEND FOR ILLUSTRATED FOLDER

KTV TOWER and COMMUNICATION EQUIP. CO.

P.O. BOX 294 • SULLIVAN, ILLINOIS

Continued from page 128

LAND CLEARING: A new 6 pg. folder in English, Spanish, Portuguese and French, is now being offered by the Fleco Corp., Box 2370, Jacksonville, Fla., showing many of the special land clearing tools available for use with Caterpillar tracktype tractors.

Fifteen different specialized tractor attachments are shown and described in the folder's catalog-type format. Specific job-report information is included to relate facts and figures on successful applications of Fleco products under different conditions. The company also offers a 4 pg. clearing tool guide, also in four languages, that pictorially describes some of the various types of Fleco equipment under actual working conditions. It contains a chart that indicates specific tool or tools the manufacturer recommends for different land clearing jobs.

For more details circle 166 on
Enclosed Return Postal Card.

STRUCTURAL COMPONENTS: Availability of a 12 pg. bulletin (300 P14), featuring both above ground and underground structural components, has been announced by Commercial Shearing & Stamping Co., 1775 Logan Avenue, Youngstown, Ohio.

Illustrated with nine actual case history photos and facts, Commercial's liner plates, ring waler, anchor bolts and tie rods, cold bent floor supports, and rib and posts are featured.

For more details circle 167 on
Enclosed Return Postal Card.

WELDING CATALOG MANUAL: A new 56-pg. welding, brazing and soldering alloy and flux catalog & instruction manual is being offered by All State Welding Alloys Co., Inc., 249 Ferris Ave., White Plains, N.Y. The 4 in. x 7 in. pocket size manual is also offered in Spanish.

Physical properties, major uses, detailed application instructions and the latest techniques for welding, brazing, soldering, cutting and hardfacing are included for joining all commercial metals. Helpful charts and tables summarize alloy selection and properties. Products are indexed by major metal use. The manual is designed for the advanced welder or engineer as well as the beginner.

For more details circle 168 on
Enclosed Return Postal Card.

MACHINERY: A new 6 pg. stuffer covering the complete product line of Parsons Shawnee, a Division of Koehring, has been released by the Parsons Co., Newton, Iowa.

The two color stuffer illustrates and describes the Parsons-Shawnee backhoe, the hydroclam, front end loaders, rear blades, and end plates for blades.

For more details circle 169 on
Enclosed Return Postal Card.

ELECTRIC CATALOG: A new 84 page catalog illustrating over 1500 electrical wiring devices, lamps and specialty products has just been released by Eagle Electric Mfg. Co., Inc., 23-10 Bridge Plaza South, Long Island City, 1, N.Y.

Among the new items being shown for the first time is the exclusive new

patented Touch-A-Matic Switch. This new catalog is designed to serve as a reference book for contractors, architects and consulting engineers. All products are grouped in categories, cross-indexed to facilitate quick and easy finding. Underwriters' listings as well as Federal Specifications numbers are also indicated.

For more details circle 170 on
Enclosed Return Postal Card.

ELECTRONIC POLYDYNE DRIVES: A new bulletin describes the new 1/4 to 25 h.p. line of Polydyne mechanical adjustable speed drives introduced by General Electric, Schenectady 5, N.Y.

Bulletin discusses principles of operation, configurations and features, and includes mounting positions, rating tables, and description of available accessories. Also discussed: the benefits of mechanical adjustable speed drives; and how to select and specify Polydyne units.

For more details circle 171 on
Enclosed Return Postal Card.

MERCURY LUMINAIRE: A new 10 pg. bulletin describes the new General Electric mercury luminaire for residential street lighting. Included is a discussion of mercury lighting advantages, a description of the M 250R's radical new refractor lens design, easy lighting layouts with application data and ordering information. Photos include cutaway view of the new luminaire dimension drawings.

For more details circle 172 on
Enclosed Return Postal Card.

WHAT ABOUT YOU, MR. READER?

Are you still active in the field? Have you moved or changed your position? Unless you send this information directly to us we can't be sure. Sometimes a reader's name is cut from the mailing list because we are not sure that our information as to name, title and address is right. Your name might be cut from the mailing list.

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Even if you think we know all about you, please fill in the information requested below and send to us by return mail. Our auditors require proof of accuracy of our mailing list. You are the only person who can help us on this. Do it now before you forget, so you can be sure your magazine will always be properly addressed to you. New names cannot be added or old names retained on our list unless we have all this information. Please print or type.

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SIGNATURE _____

With the Manufacturers

ARMCO STEEL CORP.: The first centralized research facility in the steel industry has completed its 50th year of operation, announced Armco Steel Corp.

Centralized research activities were established at Armco in October 1910. Since then the company reports that the research program at Armco has expanded to double the personnel every ten years. A new addition to the present facilities is expected to be completed in 1961.

OLIVER CORP.: Samuel W. White, Jr., has been named president of the Oliver Corp., Chicago-headquartered firm, which recently became the new farm and industrial equipment subsidiary of the White Motor Co.

Mr. White has been president of Oliver International, S.A., the company's foreign division, since 1957 and also was elected executive v.p. of the Oliver Corp. shortly before the firm completed its transaction with White Motor.

his entire business career of more than 34 years in lighting and since 1944 has been with Sylvania.

SIKA CHEMICAL: Rudolph C. Valore, Jr. has joined Sika Chemical Corp., Passaic, N. J. as Director of Research. He will concentrate on developing new products for the concrete construction industry and improving existing ones. Mr. Valore fills the post vacated by Mr. Ray Schutz who was promoted vice president for research and development, last January.

ALLIS-CHALMERS: The purchase of controlling interest in Etablissements de Constructions Mecaniques de Vendevre, S. A., French manufacturer of air-cooled diesel farm tractors, industrial engines, and engine-generator sets, was recently announced by Allis-Chalmers Mfg. Co.

Its headquarters are in Paris, with manufacturing facilities in Dieppe and Vendevre. Pierre Lancron, who has been director general of the company, continues in this capacity with the new organization.

CATERPILLAR: The appointment of Charles B. Leber to advertising manager of Caterpillar Tractor Co. has been announced by Lee Morgan, sales development manager. Leber succeeds Burt M. Powell who is retiring on Sept. 1. Powell has been advertising manager since 1953. Replacing Leber as manager of the sales division of the defense products department is Frank S. Foster.

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One of St. Louis' finest hotels
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250 rooms with bath.
Air-Conditioned. —T.V.
Rates from \$5
Free Parking.

FREE PARKING
B. H. TUREEN HOTELS

TIMKEN ROLLER BEARINGS: A special Timken board meeting in Canton, Ohio resulted in the election of R. L. Frederick to vice-president in charge of International Div. and the appointment of R. A. Gulling, the assistant treasurer, to an additional post of controller.

Frederick joined Timken in 1940 as a factory trainee and was later a grinder and assembler. Through the years he became assistant to the president, the job he held prior to his new position.

Mr. Gulling joined the company in 1943 as an IBM operator. He is now a CPA and has attended the Harvard Advanced Management Program.

LEYLAND: Roy Hall, for the past three years sales director of the Sales Executive Club of New York, has been named vice president in charge of marketing of Leyland Motors (U.S.A.) Inc., 32 E. 57th St., N. Y. City. Mr. Hall will be responsible for the marketing of the British-made Leyland trucks throughout the United States. Leyland Motors (U.S.A.) Inc., is a subsidiary of Jaguar Cars Inc. Mr. Hall has previously worked for Ford and Rolls-Royce.

SYLVANIA: Richard G. Slauer has been appointed manager of engineering-fixtures for Sylvania Lighting Products, a division of Sylvania Electric Products Inc., it was announced. Sylvania is a subsidiary of General Telephone and Electronics Corp.

Mr. Slauer succeeds George W. Clark who has been appointed Marketing manager-fixtures. He has spent



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Free GULF COAST PLEASURE GUIDE

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Bethlehem Comments on Competition

Growing competition from substitute materials and foreign steel producers is emphasized by Arthur B. Homer, Bethlehem Review, a quarterly publication.

Competition from other materials and from abroad is discussed fully in a succeeding REVIEW article which states: Foreign steel producers have an edge on American Steel companies when it comes to employment costs. Not only do they pay much lower hourly wages but the efficiency of their plants is raising. The plants which have been built in Western Europe and Japan are as good as those in this country "and they often use the same kind of equipment." This price and competition can be dealt with, states the REVIEW, through good teamwork and a better quality steel over a wider range of products.

KOPPERS Co., Inc.: Three executive changes, effective October 1, at Koppers Co., Inc., were announced.

P. D. Shollar, Vice-president-Procurement, and W. F. Alexander, Director of Procurement, have been transferred to the Office of the President where they will devote their time to special assignments that will best utilize their extensive experience which totals some 75 years with Koppers. J. D. Rice, formerly Assistant Director of Procurement, has been named Director of Procurement.

EUCLID: Appointment of Adrian F. Castilla as manager, Defense Requirements Section for Euclid Div. of General Motors has been announced by that company.

Mr. Castilla has been with Euclid since 1951 and has served in several export sales capacities including three years as a district representative for Euclid (Great Britain) Ltd. In his new assignment he will make his headquarters in Washington, D. C. He succeeds W. B. Eline who was recently named parts sales manager for Euclid.

FRINK SNO-PLOWS: According to George W. Kenyon, president of Frink Sno-Plows, Inc. Clayton, N. Y., the company, hit by a costly fire September 14th, will meet all current and anticipated orders for the 1960-61 season.

The fire, which ironically occurred the morning after the conclusion of a two-day meeting with the company's distributors and salesmen, was largely confined to the machine shop, office and a part of the production area.

T. L. SMITH CO.: The acquisition of a subsidiary, the L. O. Gregory Mfg. Co., Inc., of Memphis Tenn. was announced by the T. L. Smith Co., of Milwaukee. According to Robert W. Smith, president, this is the first in a series of planned moves to diversify and expand the company's sales.

VISKING CO: The appointment of Mr. L. J. Sinnott as general manager, special products, was announced by the Visking Co. Div. of Union Carbide Corp.

The new special products group in Visking will handle Visqueen polyethylene films used in the building and agricultural fields and will concentrate on the development of new uses and markets for plastic film products.

CUMMINS ENGINE CO.: D. J. Cummins, vice president-engineering, will take a leave of absence from Cummins Engine Co. Inc., after forty years of service. The announcement was made by E. D. Tull, Cummins president who said Mr. Cummins will continue to serve the company in a consulting capacity.

Mr. Cummins, who has been with the Company since its inception in 1919 has held many positions throughout his 40 years with Cummins. One of the diesel industry's first pilot installation centers was developed at Cummins Engine Co., under the guidance of Mr. Cummins.

BORG-WARNER: Frank W. Rickard has been elected a Group Vice President of Borg-Warner Corp., it was announced.

Mr. Rickard, who will continue in his present capacity as President of Mechanics Universal Joint Div. of Borg-Warner at Rockford, Ill., was

elected to the new position by the corporation's board of directors. He will make his headquarters in the corporation's Central Office in Chicago. Mr. Rickard has been associated with Borg-Warner for the last seven years, joining the company in 1953 as Director of Manufacturing Services.

AMERICAN-MARIETTA: Robert A. Cook has been appointed sales promotion manager of American-Marietta Co.'s Construction Equipment Div., Milwaukee, according to an announcement by the firm.

In his new position, he will be responsible for all advertising and sales promotion programs of the Construction Equipment Div., including sales training and public relations efforts.

ELECTRIC STEEL FOUNDRY CO.: Esco Corp. is the new name for the 47-year old Portland, Oregon firm formerly known as Electric Steel Foundry Co. The name change had been under consideration for some time, since Esco's expansion into fields other than the foundry business had resulted in the foundry connotation becoming a source of confusion to many potential customers.

M K DIAMOND: The Musto-Keenan Company, 1801 S. Soto St., Los Angeles, manufacturer of diamond blades and other tools, announced plans for a major merchandising campaign.

With the recent introduction of a new trademark and trade name, this

pioneer company, the oldest in the manufacture of diamond blades, has released plans for an all out campaign to introduce its blades and other products under its own trade name, M. K. Diamond.

ATLAS COPCO A. B.: Acquisition of the Swedish Diamond Rock Drilling Co., better known in many countries as Craelius, by Atlas Copco A. B. was recently revealed.

Craelius, with many overseas associates, specializes in core drilling operations for testing soil, rock strata, mines and ore deposits. Headquartered in Stockholm, the International Atlas Copco group provides compressor and pneumatic equipment sales and service in more than 90 countries in the free world.

MINNEAPOLIS-MOLINE: Bert F. Whitbread, eastern division sales manager, J. I. Case Co., has been appointed sales manager of the newly organized construction equipment division of Minneapolis-Moline Co., Hopkins, Minn. In announcing the appointment, M. E. Carroll, vice president-marketing, explained that major expansion of the Moline product line and broadened marketing activity necessitated the reorganization which separates construction equipment sales from power equipment sales. The two organizations replace the former industrial sales division.

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A detailed architectural rendering of the Valley Ho Hotel, showing its unique curved design and multiple wings. The hotel is surrounded by landscaping, including a large cactus in the foreground. The overall style is mid-century modern.

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Two courses of hot-mix Texaco Asphaltic Concrete, each two inches thick, were laid on the Asphalt Macadam foundation.

Applying Texaco Asphalt during construction of eight inch Asphalt Penetration Macadam foundation on taxiway at New York International Airport.

Asphalt Contractor:
Metropolitan Asphalt Corporation



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